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JUN 30 1927

IRON TRADE REVIEW

Registered U. S. Patent Office

CLEVELAND, O., JUNE 30, 1927

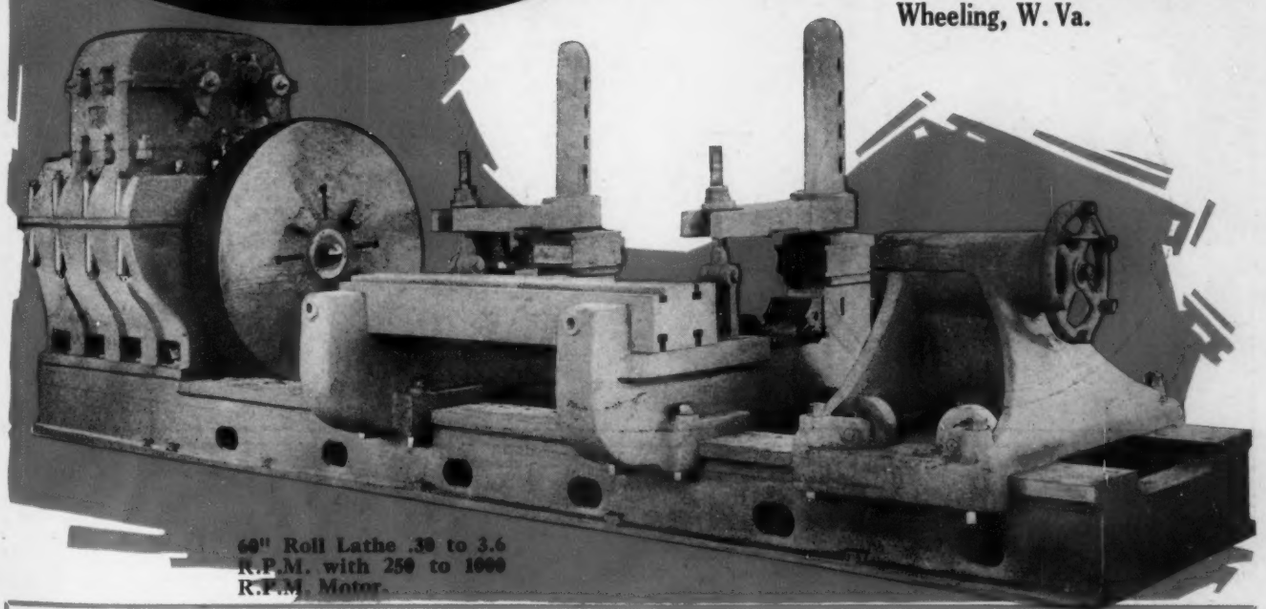
Mill Table.

ROLLING MILL EQUIPMENT
—o—
QUALITY CASTINGS

WHEELING QUALITY
STEEL ROLLS
SUPER-STEEL ROLLS
CHILLED ROLLS
SAND ROLLS

Mo-lyb-den-um ROLLS
STEEL AND IRON CASTINGS
ROLLING MILL MACHINERY
SPECIAL MACHINERY

Wheeling Mold & Foundry Co.
Wheeling, W. Va.



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THE UNITED COAL & DOCK CO. Milwaukee, Wisconsin
NACCO STEAMSHIP LINE, INC. Cleveland, Ohio

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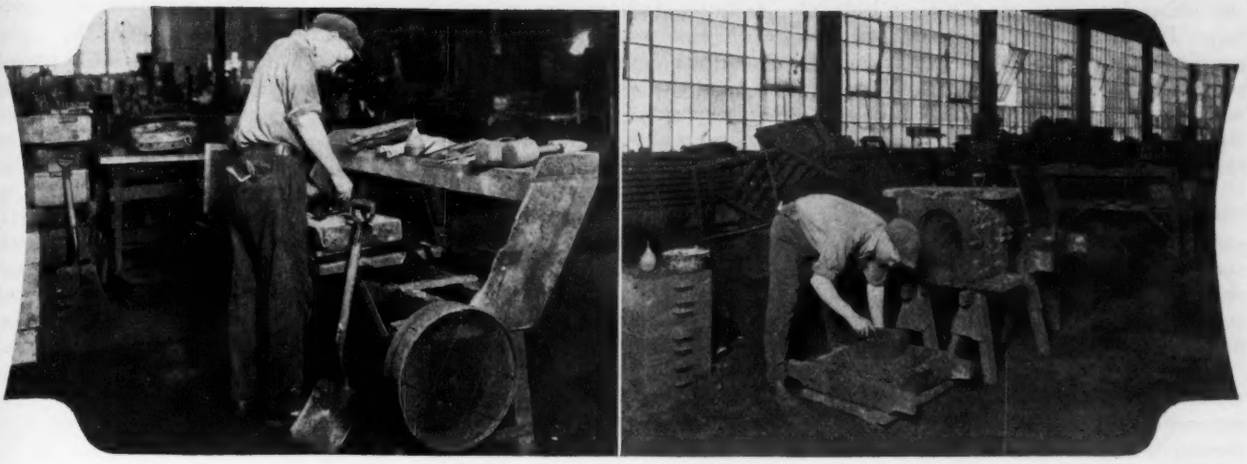


If Given Proper Attention and Help, the Apprentice Soon Develops an Interest in the Work He Is Doing

Five Industrial Cities Unite To Train Apprentices

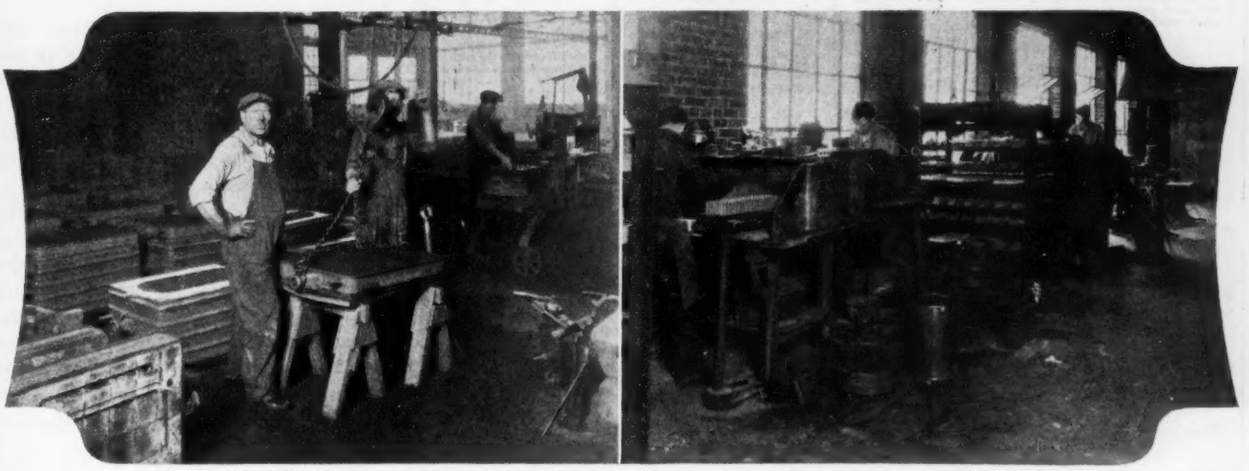
Old-Time Systems Are Modified To Conform With Modern Requirements

By S. M. Brah

APPRENTICESHIP, like other phases of education, is changing constantly to conform to new requirements. It is for this reason that the Tri-City Manufacturers association, when seeking a plan of apprentice training, selected one that is flexible enough to meet any reasonable condition which may be confronted.

The five cities of Davenport, Bettendorf, Iowa, and Moline, East Moline and Rock Island, Ill., form a compact industrial center, in which the apprentice training problem is common to all of the five communities.

For years the subject of apprentice training had received much consideration and thought by individuals and committees of the Manufacturers' association. Four years ago the local foundrymen organized the Quad-City Foundrymen's association. The moving spirits of the foundry industry used this association to further plans for a



Practically Every Phase of Foundry Operation Is Covered in that Part of the Course Relating to Shop Practice

comprehensive program of apprenticeship. It was not until a proposal was presented to this association which provided for adequate personnel to accomplish the task that a definite step forward was taken. The Foundrymen's association then merged its identity, as regards apprenticeship activities with the Manufacturers' association. A community survey was started, the local schools were approached and the necessary administrative committees representing the manufacturers were organized.

A committee was formed of the members of the association. This committee is known as the apprenticeship committee and its duties consisted in establishing policies and sponsoring the success of the program. Subcommittees were appointed to deal with problems in foundry, machine shop and woodworking shops. An educational committee was formed to deal with problems of study, schedule, facilities and policies of school work. A uniform indenture as shown in an accompanying illustration was adopted by the general committee.

The separate committees next passed on the wage scales for the various trades and the special conditions arising in connection with wages. Provisions were made for accepting grade school graduates, high school and college graduates and adult specials. All were given consideration as to the wage allowance. Ideal work schedules covering the different trades and showing the number of hours to be spent on the different operations also were drawn up and passed upon by the committees.

Semimonthly meetings were held by the committees until conditions justified meetings at longer intervals. Monthly meetings now are held to survey the progress of the program, to arrange for contests and to pass upon school policies and changes in work or rate schedules, which may be necessary from time to time.

With policies adopted and passed by the apprenticeship committee, the next step was to survey the plants and see where apprentices could be used to advantage. The survey also established the number required to overcome the turnover from death, promotions and losses by other causes. Negotiations were begun with each plant separately and the management consulted as to the present apprenticeship program in operation. If none existed the management's views on the matter were solicited and noted. Permission was obtained to proceed with the preliminaries and a mass of information was secured from the plant.

This information included the number of men working, the number of mechanics, the vital operations and their type, the average turnovers in special departments and special operations in the production of that particular plant. This information was noted and tabulated on a survey sheet prepared for this purpose. The information then was analyzed and a report prepared which stated the present program, if any, and the proposed program with a schedule of work for each trade to fit the needs of the particular plant. Wherever necessary, a detailed proposal was submitted for the proper administration of the entire program and the sanction and adoption of the management solicited.

The employing plant then appointed an individual whose duties are those of an apprentice supervisor and who has direct charge of the program and its results in his particular plant. The duties of apprentice supervisor may be briefly stated as follows:

Obtain a sufficient number of applicants to fill the requirements at all times.

Employ the apprentices as called for by the schedule or operating conditions.

Provide for transfer of apprentices at the proper time to the various machines and processes, as demanded by their indentures.

Hold weekly meetings of the apprentices and arrange to have talks on shop and educational subjects.

Act as a representative of the management before apprentices in all matters pertaining to their training program and also to their welfare.

Enroll apprentices in the proper classes and supply them with suitable educational service and equipment. Recommend outside reading for the boys on current technical subjects in the various trade magazines.

Plan outside activities for the boys.

Act as guardian for the boy as long

TRI-CITY MANUFACTURERS ASSOCIATION
APPRENTICE INDENTURE

THIS INDENTURE, made in triplicate this.....day of.....,19....

between.....of.....(City, State), hereinafter known as the Employer, and

.....of.....(Address) (City, State), a minor born

....., hereinafter known as the Apprentice, and.....,

hereinafter known as the Guardian, whose relation to the Apprentice is.....

WITNESSETH, That for the purpose of acquiring the Art or Trade of.....,

said.....hereby becomes an Apprentice to said Employer and said Employer hereby accepts him subject to the terms of this agreement and the regulations on the reverse side hereof.

The Employer Agrees:

1. The Employer agrees that he will cause to be carefully and skillfully taught to the Apprentice this trade to which he is hereby indentured, subject to the conditions of his shop.

2. The Employer shall have the right to terminate this agreement for inability on the part of the Apprentice to do the work or acquire the knowledge necessary for graduation, or for repeated infraction of the rules and regulations governing apprentices.

3. The Apprentice and his Guardian shall have the right to terminate this agreement for satisfactory personal reasons and upon proof of same, the Employer shall furnish a statement terminating the agreement.

The Employee Agrees:

1. The Apprentice and his Guardian hereby promise that the Apprentice shall conform to and abide by all provisions of this agreement, and shall faithfully and diligently serve his Employer during the full period of time named in this agreement.

2. The Apprentice and his Guardian agree that the Apprentice is to attend related class-room instruction.....hours per week or its equivalent. The cost of related school work, including textbooks, will be.....dollars. Of this amount, the Apprentice and his Guardian hereby agree that the Apprentice shall pay one-half, or.....dollars, at the rate of.....dollars per month, deductible from the pay of the Apprentice. The Employer hereby agrees to pay one-half of total cost, or.....dollars.

The Apprenticeship shall begin on the.....day of.....19....., and shall be for a period of.....years. The length of year, the compensation for the term of apprenticeship, and the processes, methods or plans to be taught shall be as per Exhibit A attached hereto.

At the completion of the apprenticeship, the Apprentice shall receive from the Employer a certificate stating that the work herein described has been satisfactorily performed.

IN WITNESS WHEREOF, the parties have caused this indenture to be signed:

.....Company

.....Employer .....Apprentice

By..... .....Guardian

A Uniform Indenture Was Drawn Up By the Local Committee

as he is an apprentice to that company. Molding the character of the boy as well as directing his training to journeymanship.

In recruiting apprentices, the boys then employed in the shop were interviewed first. Boys whose fathers had been in the employ of the plant for sometime were given second consideration providing their qualifications were satisfactory. This means of obtaining apprentices assured, to a certain degree, the exact type of boy desired.

To interest other boys in the apprenticeship project, provisions are made whereby the boy at work during the day can get information at an appointed time during his leisure hours. Boys already enrolled bring their companions who are interested to the district office on designated evenings. Several hundred applicants have been interviewed and classified as to age, education, qualifications, the trade desired.

Hand in hand with gaining co-operation of the mangement of the plants came the essential matter of gaining the wholehearted co-operation of the school board since the school problem plays an important role in an undertaking of this kind. The boards of education in each city and the superintendents were interviewed and their co-operation solicited for the success of this community venture. Five boards passed favorably upon the general idea and then asked for details. First the problem of finances arose. This was met by appealing to the state for aid in this project from state educational funds. It must be said the respective state officers of Illinois and Iowa were quick to see the worth of the experiment and their aid was assured from the start.

With this promise the school boards were approached again and their approval given.

It seemed unwise to go ahead on too big a scale at the start so it was decided to join the three municipalties into one on the Illinois side of the river and employ one instructor, a specalist, to cope with the education of the apprentices. The final result was that East Moline, Moline and Rock Island joined hands in sharing 50 per cent of the salary of the instructor, the state sharing the other 50 per cent. Iowa has approximately the same arrangement, the local school board providing the instructor and paying one-half of his salary, the remainder being paid by the state.

The classroom work is carried on in the regular school buildings centrally located and the instructor goes to each town to meet with the apprentices, his students. This makes a minimum amount of traveling. The classes are of a four hour duration and cause little interruption to the shop production schedules. This class work consists of mathematics, civics, shop economics, English and related work.

As in all undertakings, publicity has helped to produce results. The fact that such a program exists in the community is brought before the eyes of the people from time to time through the newspapers and other means. Talks are given before civic organizations, parent-teachers' meetings, and other bodies to recall to the minds of the citizens that opportunities exist in the shops and offices of their own community industries.

The tangible results best may be analyzed from the number of apprentices enrolled as shown in the following table:

Type of trade	Apprentices enrolled
Foundry	42
Machine Shop	52
Pattern Shop	17
Sheet Metal	1
Electrical	2
Drafting	2
Office	1
Manufacturing or production	2
	119

True results best may be measured in light of a statement made by one of the foremost leaders of the community who said "For 18 years the apprenticeship program of this community was a before breakfast and after dinner subject for discussion, but nothing tangible was accomplished. In one year we have over 100 boys at work in various trades."

EXHIBIT A

Extent of Period of Apprenticeship:

This apprenticeship shall be for.....periods of.....hours each, or a total of .....hours, or.....years.

Schedule of Processes to be Worked—(Here must be stated the processes, methods or plans to be taught and the approximate time to be spent on each.)

The time distribution of the work schedules may vary from the above, which will be adjusted by the shop Superintendent dependent upon business conditions and the ability and the requirements of the apprentice.

Compensation to Be Paid—The Apprentice shall receive in wages:

.....cents per hour for the first period of 1220 hours.
.....cents per hour for the second period of 1220 hours.
.....cents per hour for the third period of 1220 hours.
.....cents per hour for the fourth period of 1220 hours.
.....cents per hour for the fifth period of 1220 hours.
.....cents per hour for the sixth period of 1220 hours.
.....cents per hour for the seventh period of 1220 hours.
.....cents per hour for the eighth period of 1220 hours.

Special Provisions:

Period of Apprenticeship and Compensation Were Noted

Keen Competition by European Steelmakers Wipes Out Profit

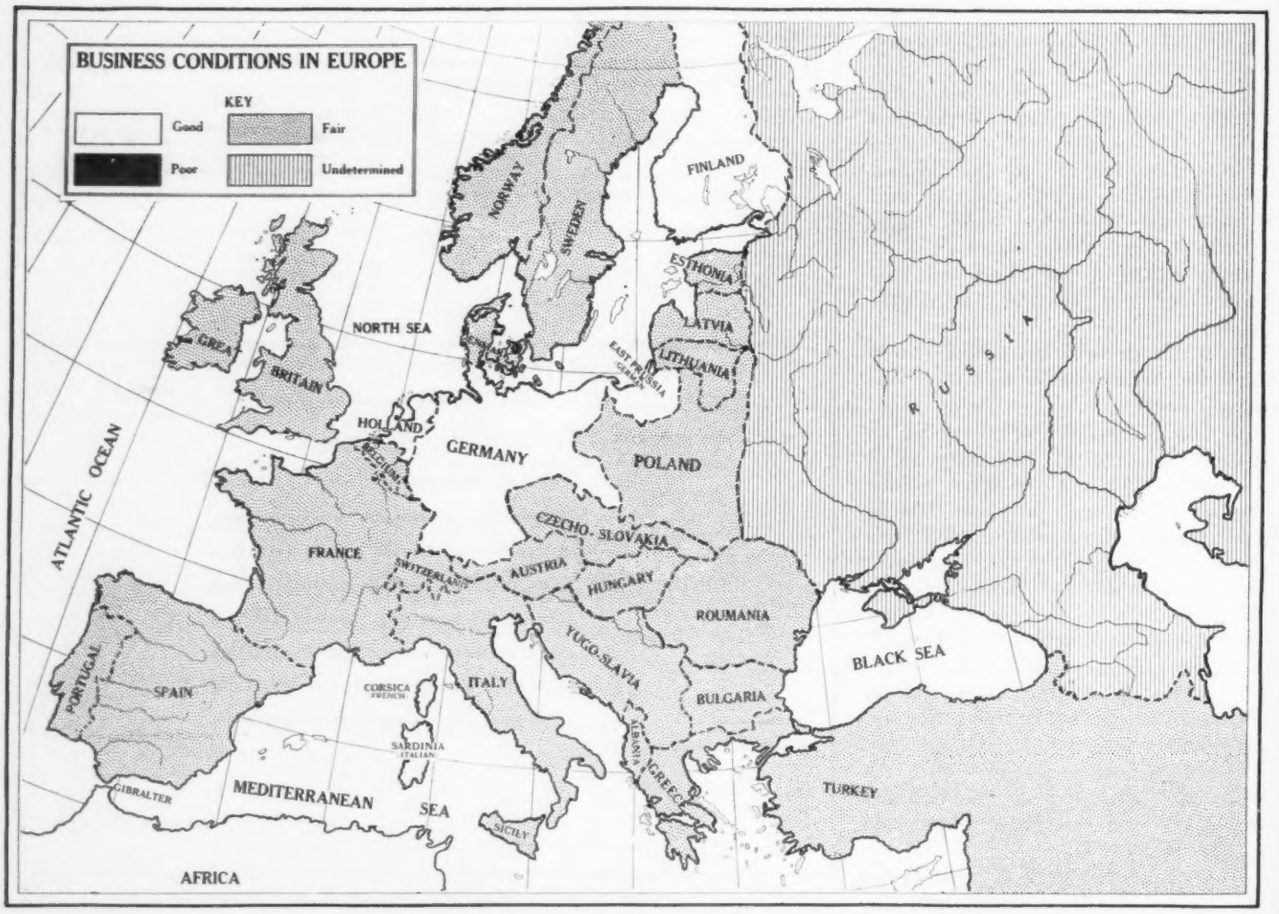
By Vincent Delport

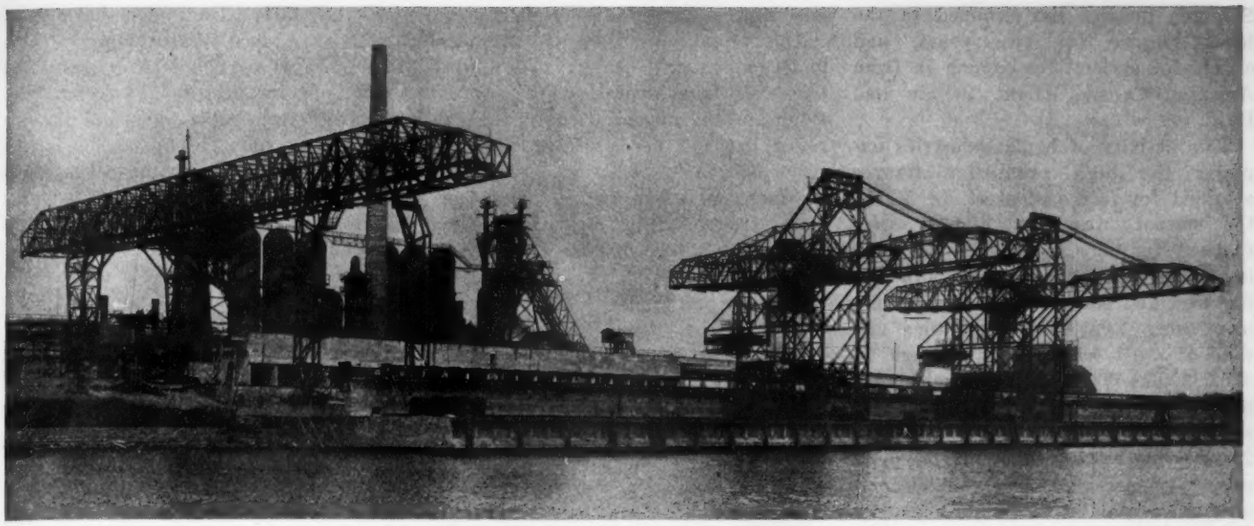
European Manager, Iron Trade Review

APART from the breaking of diplomatic relations between Great Britain and Soviet Russia and the resulting effect upon trade between these two countries, the second quarter of this year has not been marked by any outstanding events, especially in the iron and steel trade. In the four principal steel producing countries of Europe: Germany, Great Britain, France and Belgium, the production of steel ingots and castings during the first four months has exceeded all previous figures of the corresponding period of previous years, but in those same countries the daily output in April showed a decline and there are distinct signs of a continued slowdown, except perhaps in Germany.

Foreign trade has been hampered by events in the Far East and production of iron and steel has been in excess of the demand, with the result that competition among continental producers has been of the keenest kind and export prices have reached an unprofitable level. This competition has been mostly ascribed to France, Belgium and Luxemburg, British producers being unable to shade prices sufficiently, and Germany being sufficiently active at home to refrain from taking export business at unremunerative prices. However, it is felt that these conditions are abnormal, and although little advance has been made in negotiations toward the formation of international selling syndicates, the unsatisfactory state of iron and steel export trade should induce the representatives of the interested nations to come to an understanding. One step forward has been made with the constitution of the wire rod syndicate which is nearly completed and which includes Germany with a quota of about 1,000,000 metric tons, France with 400,000 tons, Belgium with about 275,000 tons and Luxemburg with 120,000 tons. The minimum basis price of wire rod is now fixed at £5 7s 6d ($26.00) f.o.b. Antwerp.

Great Britain's recovery is slow. The spurt afforded iron and steel production by the accumulation of orders caused by last year's coal stoppage is now subsiding. A record output of steel was reached in March with 949,600 tons, but there was a drop of 100,000 tons in April. On the other hand, pig iron production reached the





Holland has been coming more prominently into the steel industry. This is a recent blast furnace plant in that country

high figure of 680,000 tons in April, but since then several blast furnaces have been damped or blown out. This depression is due to lack of new orders, consumers having bought freely from the continent where iron and steel could be obtained at considerably lower prices than in the home market. Recently the price of foundry pig iron was brought down to the pre-strike level, but this step was not immediately followed by a revival of business because substantial stocks of continental iron had been built up. There is little hope of a further reduction in prices because furnace operators claim that already they are making hardly any profit, with the result that if the buying movement does not expand more stacks will be put out of commission.

Exports of iron and steel since the beginning of this year remain below last year's figures, shipments for the period ending April 30 amounting to 1,158,655 tons in 1927, against 1,395,730 tons in 1926. On the other hand, imports were still abnormally high, the figure for the first four months of this year reaching 1,881,696 tons, compared with 970,514 tons last year. It is a moot question to what extent the breaking of diplomatic relations with Russia will affect British foreign trade. This means the suppression of the Russian trade delegation in Great Britain and the suspension, at least for a time, of the activities of Arcos, the organization that handled commercial transactions with Britain under the control of the Soviets. A credit of £10,000,000 ($48,500,000) had been arranged between the Russian trade delegation and the Midland Bank to finance future Russian orders of British products, especially machinery. No actual trading contracts had as yet been effected under this agreement which now is cancelled.

It is interesting to note that the declared value of the produce and manufactures of the United Kingdom exported to Russia during the whole of 1926 was £5,860,890 ($28,500,000) out of a total of £651,892,504 ($3,150,000,000) for all markets. For the first quarter of this year, exports of British products to Russia are valued at £1,363,358 ($6,650,000) out of a total of £170,473,394 ($825,000,000). The value of imports from Russia for the whole of last year was about four times the value of exports to Russia, and for the first quarter of this year Russian imported products were valued at £3,464,836 ($16,800,000). Iron and steel does not figure in this exchange with Russia, but substantial orders for machinery were expected and will no doubt be captured by other countries. In view of the above figures, however, British foreign trade will not be seriously affected by the loss of the Russian market and a certain volume of new business will gradually build up in time.

Europe's Trade Map Is Mainly Fair

GOOD

Germany

FAIR TO GOOD

Finland *Holland*

FAIR

Sweden *Esthonia*
Lithuania *Poland*
Belgium *Turkey*
Luxemburg *France*
Spain *Austria*
Hungary *Rumania*
Great Britain
Czecho-Slovakia
Yugo-Slavia

POOR TO FAIR

Norway *Portugal*
Denmark *Switzerland*
Italy *Albania*
Bulgaria *Greece*
Latvia

UNDETERMINED

Russia

Unemployment in Great Britain is hovering around the million mark and on May 23 the number of unemployed was 978,200, the lowest total since 1920, from which year the period of trade depression dates. The outlook in the coal trade is not yet satisfactory, but conditions are better in the shipbuilding, engineering and certain textile districts.

Germany's domestic trade has shown further improvement, which is not limited to iron and steel business only. The German cotton mills have sold their production for the next four or five months and the weaving mills generally will be fully employed for at least four months. The spinning mills are working at over 90 per cent capacity and orders still are coming in. The electrotechnical industry reports progress and orders for cables, wire, signalling apparatus have been received from the railroads. Building is active and demand from shipyards has increased. Demand for pig iron in the foundries is growing, giving an indication that the machinery works are enjoying better conditions than of late. Unemployment in the

Solingen district has dropped to the lowest figure for two years, and orders for cutlery are coming in from America, Canada, Great Britain and Italy.

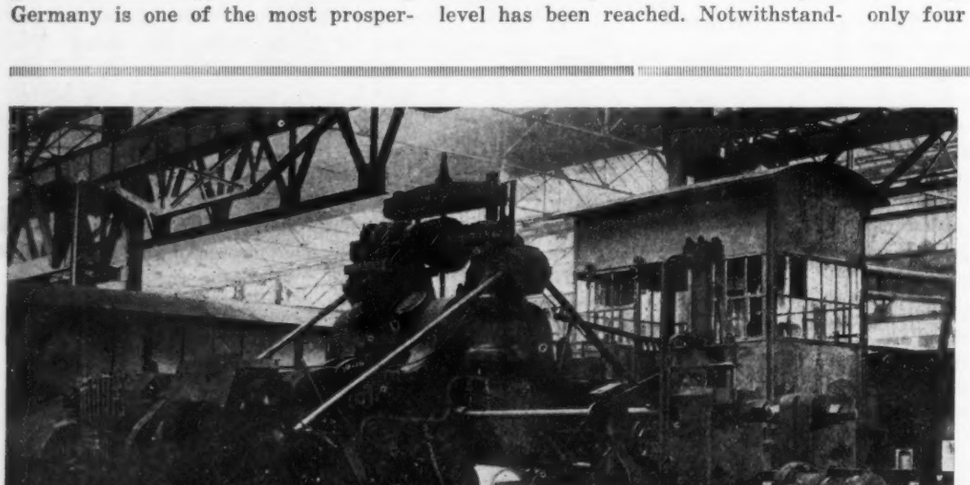
This activity of home industries explains the high production figures attained for iron and steel. In March the output was the highest ever reached for any month by Germany in its present boundaries, both for pig iron and steel, the tonnage of pig iron being 1,085,859 metric tons and that of steel ingots and castings 1,415,083 tons. For the first four months of the year, German production of raw steel was 4,105,080, metric tons, or 20 per cent more than in the same period of last year. The bulk of this production was for domestic consumption, notwithstanding the fact that exports of iron and steel for the first quarter of this year were 1,320,953 metric tons, or 7 per cent in excess of the shipments effected during that period last year. However, during May this year German producers did not press sales on foreign markets owing to the low prices prevailing.

One result of this high rate of production in Germany is that German steelmakers have to pay considerable sums to the common fund of the continental steel entente. This naturally is not to their taste and rumors have been going about according to which Germany might retire from the entente if an adjustment were not made. It is unlikely that Germany should take such a step, especially while negotiations toward the formation of international selling syndicates, which carry great hopes, are in progress. Undoubtedly, for the time being Germany is one of the most prosperous nations in Continental Europe.

The situation in France has not undergone much change. The industries continue depressed. The crisis following the appreciation of the currency has not been so acute as was expected in certain quarters, but its duration is exceeding expectations. However, the time has come when producers will no longer agree to operate their plants at a loss as they have been doing for some time. Iron and steel gold prices today are below the pre-war level, while costs have risen. On the other hand, domestic consumers are taking care of only their immediate requirements, while export orders are obtained only in the face of keen competition from Belgium, Luxemburg and sometimes Germany, and by making unprofitable price concessions. Should these conditions be maintained, a number of concerns must begin to feel the pinch financially. Already there are signs of decreasing production in steel. Of the four leading producing countries in Europe, France is the only one whose steel output for the first four months of the year is below the figure reached in the same period last year, though to a small extent, it is true.

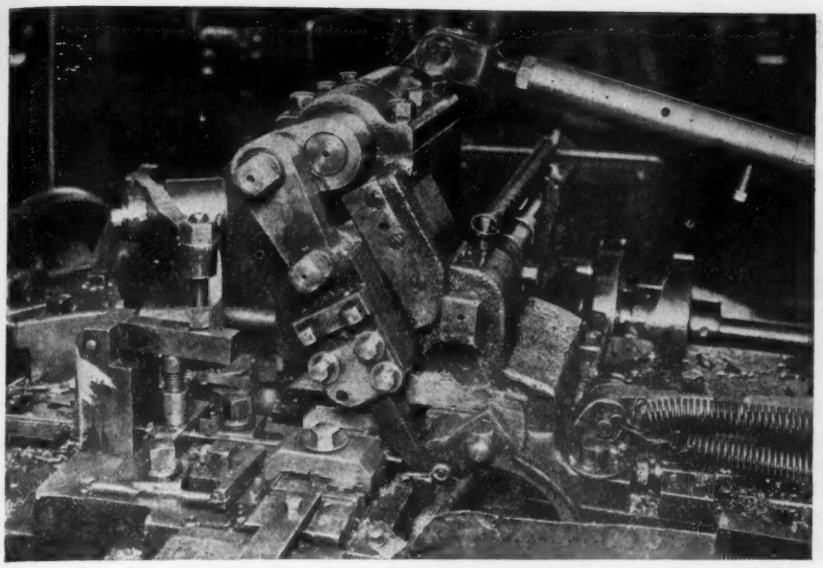
In Belgium and Luxemburg the situation is mostly governed by the conditions of export trade which have been generally unsatisfactory as regards price. The smaller concerns are depressing the market by the concessions to keep their works going. The leading concerns are counteracting by refusing to accept offers which are unprofitable, with the result that the bottom prices appear to have been attained in April and now a higher level has been reached. Notwithstanding the difficulties which have been in the way since the beginning of this year, a few of the leading iron and steel companies in Belgium and Luxemburg are reporting satisfactory financial results because they have taken great pains to install modern equipment and to run their business on more efficient methods, thus considerably reducing production costs.

The effects on business of the appreciation of the Italian lira are keenly felt in Italy and most industries are working on short time, with the exception of shipyards and electrical works which enjoy government assistance. Unemployment is now a serious problem in Italy and at the end of May there were about 220,000 people officially registered out of work. Although iron and steel producers have reduced prices there has been little revival of buying and it is possible that more blast furnace stacks and steelworks will have to close down; at present there are only seven blast furnaces operating in the country. Some rolling mills also are being put out of commission. The automobile trade is dull and orders for railroad rolling stock are scarce. Imports of foreign iron and steel into Italy are dwindling, not only on account of the industrial depression but also due to the protectionist policy of the government. One of the most active departments is the electrification of railroads which has been progressing at a high rate since the beginning of the year. There now are 1100 kilometers (690 miles) of electrified lines operating. The textile industry is passing through a critical period and the majority of mills are working only four or five days a week.



PIERCING mill for large unit at plant in Germany. It produces tubes up to 16 inches in diameter. Home demand in Germany is keeping such plants busy without need for exporting products

Large Uses of Steel in Small Ways



Screw Eyes Are Formed and Pointed Rapidly From Coiled Wire on Automatic Machines.

Screw Hooks and Eyes

A FAMILIAR article at the summer camp is the screw hook which fastens screen doors, gates and cupboards. This type of hook and eye in a great variety of sizes is produced in large numbers. The trade designates this particular kind of hardware as bright wire goods, and most statistics are concerned with this classification, which in addition to screw hooks and eyes contains some special wire forms. However, screw hooks and eyes make up about 90 per cent of the bright wire goods classification.

The country's annual production of bright wire goods is estimated by one of the leading manufacturers at 3000 tons. Five or six companies are large producers of screw hooks and eyes in addition to a number of plants turning out smaller amounts. One eastern plant produces 500 gross of screw eyes per day, and about 300 gross of hooks per day.

The daily production of hooks, based on figures of several producers is estimated at 2500 gross. It is difficult to approximate an average weight per hook, but records of sales of one company indicate that a hook which weighs 2¼ pounds per gross fairly represents the average weight. Using this figure gives 2.8 tons per day, or about 840 tons a year.

Nearly twice as many screw eyes as hooks are produced, but the average weight is about half that of the hook, which means that the country's annual production of eyes would weigh about the same as the hooks, or 840 tons. This makes a total of about 1700 tons. Although this does not check closely the 3000-ton estimate for bright wire goods, it seems fairly certain that between 1500 and 3000 tons of wire is made up into screw hooks and eyes each year.

Automatic machinery has been designed to do most of the work. Wire fed from a coil is formed, pointed and cut off in a single operation on automatic machines. The rate of production varies according to the size and design. An average size eye is formed at the rate of 60 to 100 a minute.

The products of these automatic forming machines then are transferred to tumbling barrels where mixed with sawdust they acquire the familiar bright surface. The next operation is rolling the thread. This is done quickly on thread rolling machines which are fed by hand. The hooks are formed with the eyelet not quite closed and the assembly is completed by slipping on an eye and then closing the hook loop under a press. The hooks are packed with extra eyes, a gross to a box. The count is usually determined by automatic weighing machines.

Plain basic round steel wire is the usual material used. Some hooks, however, are made from flat wire and some from half round wire. A large number of hooks of similar design are made of brass.

THIS is the ninety-third of a series of articles dealing with some of the obscure uses of steel which go far toward absorbing the great American tonnage.

Among articles appearing every two weeks and not included in Vol. I containing 51 separate descriptions are:

Tie Plates	*Camp Stoves*
Tacks	*Bottle Caps*
Knives and Forks	*Artificial Limbs*
Fence Posts	*Finger Nail Files*
Dental Drills	*Pencil Lead Boxes*
Rat Guards	*Small Steel Cases*
Overall Trimmings	*Lace Tips*
Shoe Steel	*Oil Cups*
Skates	*Ventilators*
Golf Clubs	*Toy Autos*
Burial Caskets	*Safes*
Scissors—Shears	*Steel Derricks*
Pistols	*Handle Cores*
Milk, Ice Cream Cans	*Typewriters*
Telephone Indices	*Steel Cross Arms*
Steel Heddles	*Ticket Punches*
Magazine Racks	*Wrenches*
Lawn Mowers	*Stamp Pads*
Shelter Houses	*Hair Clippers*
School Furniture	*Shuttles and Bobbins*
Vacuum Bottles	

1926 Another Good Year for Dye Makers

Domestic production of coal-tar dyes in 1926 totaled 88,000,000 pounds valued at $37,000,000, states the federal tariff commission. The increase in quantity over 1925 was 2 per cent. Total sales of dyes in 1926 were 86,200,000 pounds valued at $36,300,000, an increase of 8.7 per cent in quantity and a loss of 3 per cent in value from 1925. Production of vat dyes—4,000,000 pounds—set a new high last year. Imports of coal-vat dyes in 1926 were 4,658,464 pounds, against 5,315,158 pounds in 1925. Exports were 25,811,941 pounds compared with 25,799,889 pounds in 1925.

Sheets Rolled to 16-Gage on Three-High Backup Mill

Skew-Type Feed Table and Side Guides Enforce Straight Line Movement to Piece in Transit Between Stands

By John D. Knox

SEVEN stands of horizontal rolls and four stands of vertical edging rolls are included in the bar mill layout. These are arranged in tandem and the slab emerges from one set of rolls before it is engaged by another. The seven stands each are equipped with 2-high rolls, 30 inches diameter and 58 inches long. The top roll in each stand is balanced, that is, it is supported by spring bolsters which prevent it from dropping onto the lower rolls with its whole weight as the rear end of the slab emerges. Because of the thickness of the slab used, the top rolls of the first two mills are driven through individual stands of 2-high pinions. These are installed at the right side of the housing. Power from the motor and reduction gears on the opposite side, is transmitted through the lower roll to the bottom pinion, thence to its mate above, and, finally through a shaft coupled to the top roll.

All stands of rolls are driven through double reduction gears. Nos. 1, 2, 4 and 5 stands are actuated by individual 500-horsepower motors operating at 585 revolutions per minute; No. 3 by a 300-horsepower motor operating at the same speed; and Nos. 6 and 7 stands by separate 600-horsepower motors operating at 870 revolutions a minute. Edging stands Nos. 1, 2, 3 and 4 are actuated by the drives of Nos. 2, 4, 5 and 6 stands of horizontal mills, respectively.

Beginning with the first stand on the tandem bar mill, the speeds of the horizontal rolls are 14, 20, 25, 25, 25, 36 and 36 revolutions a minute. A stand of vertical edging rolls is installed after Nos. 2, 4, 5 and 6 stands of horizontal rolls. From the gap of the shears to the centerline of the No. 1 stand of rolls is 30 feet, 5/8-inch. From the centerline of the rolls in No. 1 stand to the centerline of the set in No. 2 is 19 feet; from No. 2 stand to No. 1 edger, 10 feet; from No. 1 edger to No. 3 stand, 10 feet; from No. 3 to No. 4 stand, 19 feet; from No. 4 to No. 2 edger, from No. 2 edger to No. 5 stand, from No. 5 stand to No. 3 edger, from No. 3 edger to No. 6 stand, and from No. 6 stand to No. 4 edger, 10 feet each; and from No. 4 edger to the last stand of horizontal rolls, 14 feet.

Steel rolls are used in the first four stands and chilled iron rolls in the remaining three stands of horizontal mills. The attention of the reader recently was directed to the importance of controlling the various factors which enter into the formation of an active pass. One of the factors, as will be recalled, had to do with the temperature which causes the rolls to expand and change their contour. So as a means of controlling the temperature and at the same time of preserving the shape of the active pass, water from a spray mounted above each top roll is permitted to flow in the right proportion over its face.

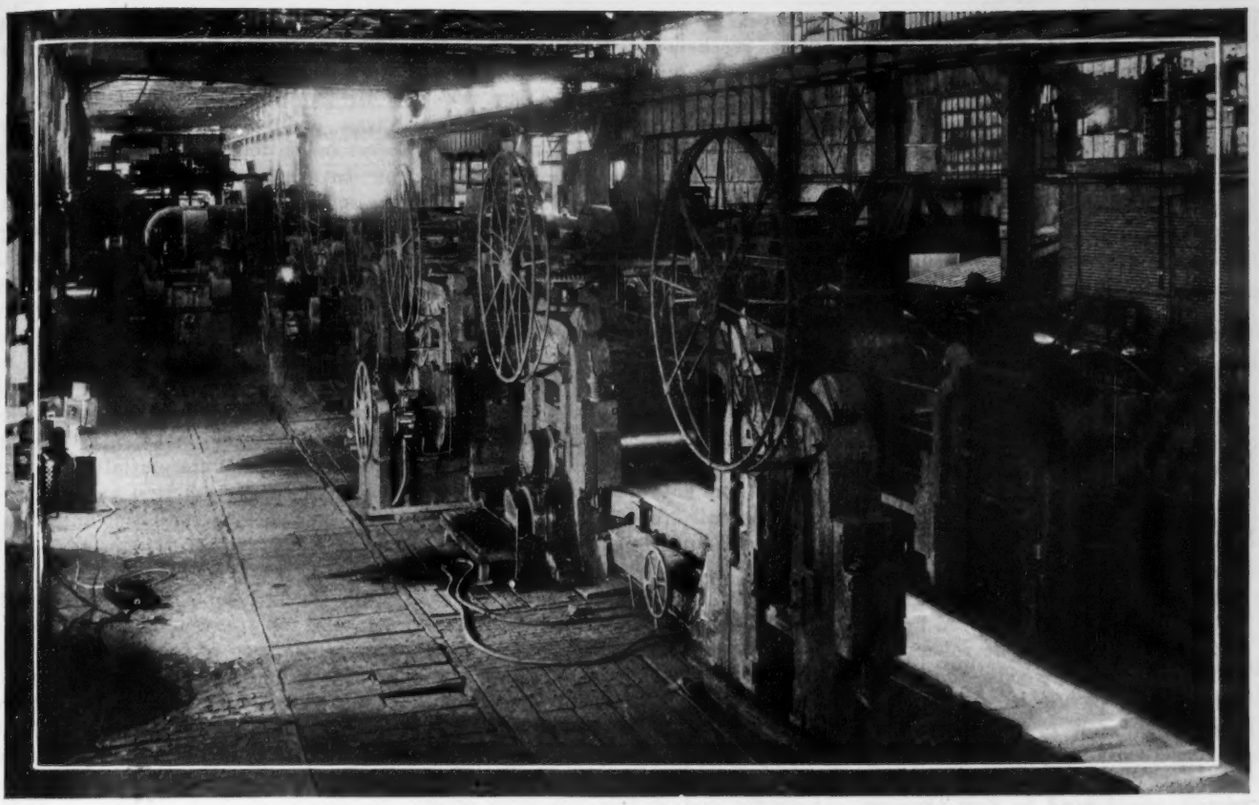
As previously mentioned, a mechanical break or drag usually is installed on the last stand of a train of ordinary sheet mill rolls to prevent fluctuating roll speeds. This practice also is employed on the tandem bar mill. Each bottom roll of stands No. 3 to 7, inclusive, is turned with a shallow groove on its right neck which extends outside the housing window. Two oak slabs are placed in the groove 190 degrees apart and their ends yoked together tightly by bolts. Thus each drag imparts sufficient friction to the roll neck to take up any looseness or backlash in the drive between the mill and the motor which otherwise would produce a wave on the surface of the piece being reduced.

Each portion cut from the slab is given two horizontal passes, then an edging pass, then two horizontal passes and then alternately an edging and horizontal pass through the remainder of the tandem installation. A chain conveyor delivers the piece into each stand of edging rolls. The rollers in the table which connect horizontal stands Nos. 1 and 2, are placed askew and direct the pieces against the right side guard and into the rolls always at the same position on the working face. A similar setup is provided between stands Nos. 3 and 4, only the piece is made to follow the left side guard into the rolls. Between Nos. 5 and 6 stands the piece again is skewed against the right side guard before it enters the rolls.

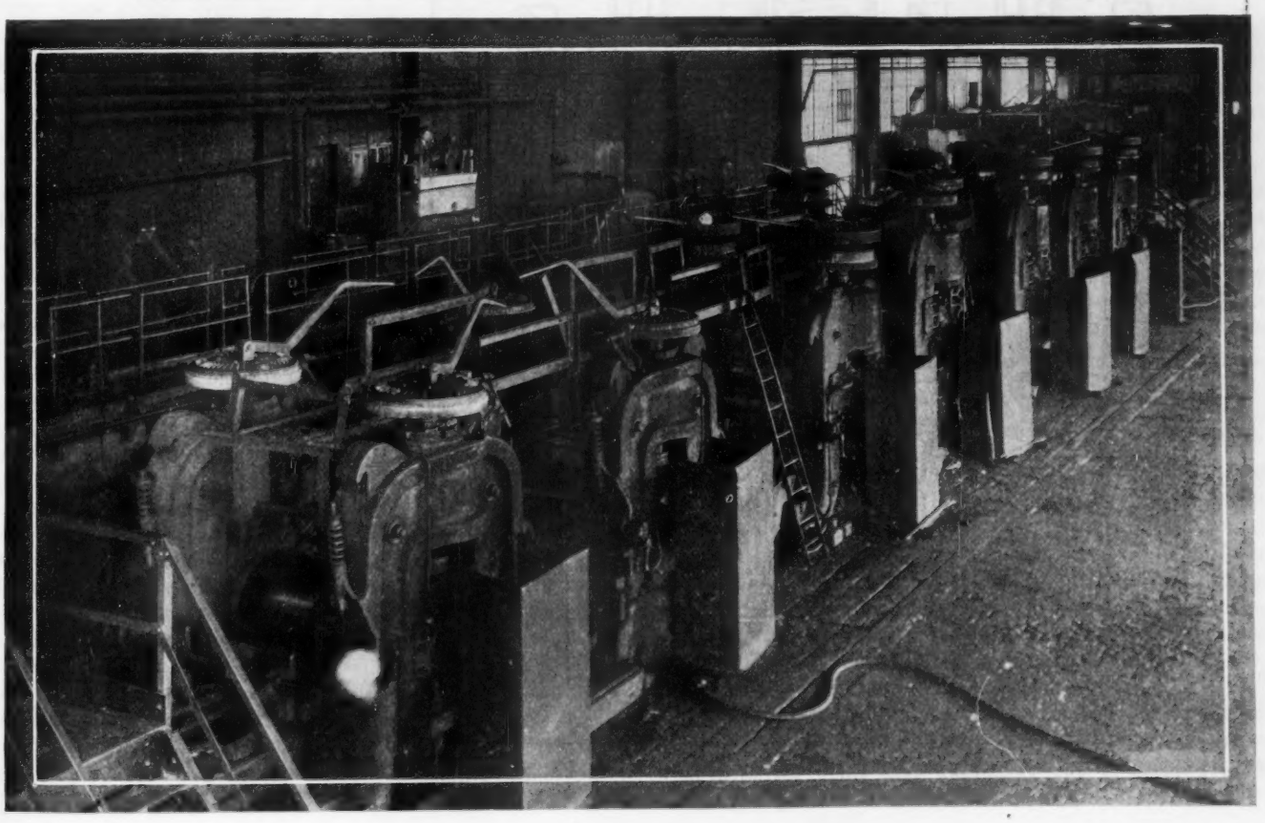
In tandem mills difficulty frequently is encountered in obtaining an accurate placing of the piece with regard to the numerous stands of rolls because the rolling action, due to the improper fit of the rolls to the piece, is not always perfect. Feed tables equipped with side guides usually are employed to enforce a given path to the material in transit between stands but the force imparted to the piece by the driven rollers frequently is not sufficient to force it to pass between two guides where any jamming occurs. Moreover, the piece has a tendency to curl at the ends due to the roller action and this curled portion often will force its way down between the rolls in the feed table.

This, however, is avoided in the setup between the horizontal stands of the bar plate mill by using a table in which the rollers are arranged askew to the desired line of feed, and in which the stands of rolls are offset slightly so as to be out of true center line with each other. The side guide structure, in this case, acts to enforce a straight line movement to the piece and the skewed rollers to keep the piece up against the side guides. The purpose of staggering

THIS is the third of a series of articles describing in detail the new continuous sheet mill of the American Rolling Mill Co. at Ashland, O. The first two installments, presented in the June 9 and 16 issues of IRON TRADE REVIEW, discussed the principles upon which continuous rolling of sheet steel is based. The fourth installment will appear in next week's issue.



BAR plate mill looking toward the front end is shown above. The upper rolls in the first two horizontal stands of this installation are driven through separate stands of pinions. Below is shown the 7-stand jobbing mill which produces sheets up to 16 gage, 44 inches wide and 140 inches long. The last three stands are equipped with 3-high rolls, reduction being effected only by the bottom and middle rolls. Stock can be delivered by the last stand at 666 feet a minute.



the roll stands is to permit the piece to become aligned with the guides, thus avoiding the chance of jamming between stands.

A line drawn through the center of and at right angles to the rolls in the No. 1 stand will not coincide with a similar line through the rolls in the No. 2 stands so that the piece will have to move in the direction of the skew of the rollers in order to be centered between the rolls of stand No. 2.

Piece Is Guided Straight

The tendency of the skewed rollers is to force the piece to travel in a direction at right angles to the axes of the rolls. This tendency is opposed by the side guides with the result that the piece takes a straight line contact along the edge of the right guide only. As the piece enters the No. 2 stand it is centered between and when it emerges the rollers force it against the left side guide. The guide pieces or flights, which lie between each roll of the skew table, are designed to present slanting surfaces at points where the pieces in transit would tend to jam thus preventing the piece buckling between the rolls of the feed table.

Any scale loosened by the rolls is removed from the surface before the piece reaches the next stand. This is done by directing water against the bottom surface of the bar, while it is in transit between certain stands and by blowing steam against its top surface between other passes. The slab, reduced in the seven passes from 4 to 7/16-inch, plus or minus, leaves the last stand of bar mill rolls at a surface speed of approximately 280 feet a minute and at the time of delivery it is 312 feet, 8¼ inches from the blooming mill.

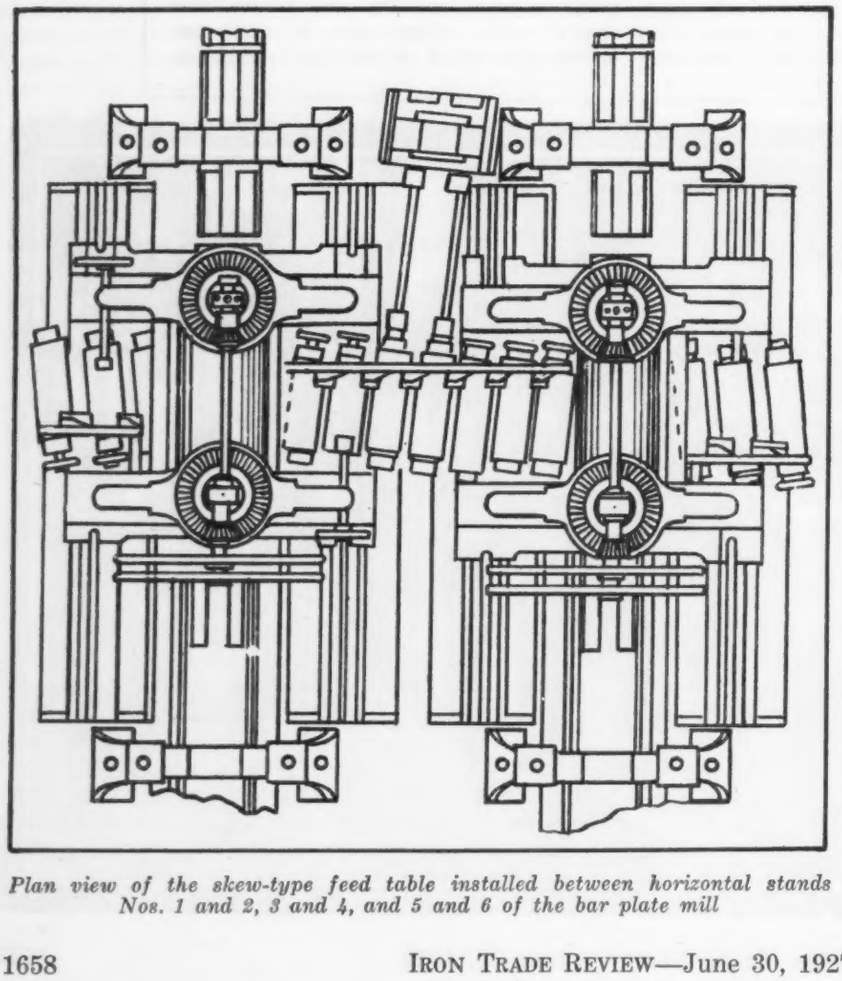
At this point flexibility of the layout again is exemplified by reason of the fact that the material coming from the bar mill either can be passed straight ahead to the jobbing mill or delivered to a storage yard later to be used by the conventional type of hand sheet mills. In the latter event, the product is brought to rest on the bar mill run-out table when its forward end is about 100 feet away from the centerline of the last stand. It then is moved broadside across a rail-type transfer table and is received by another roller table which again moves it straight ahead. When near the end of this table, the piece is pulled broadside across another rail-type transfer table onto a third roller table. This conveys the bar to a 60-inch shear where it is cut into suitable lengths and then piled by a pair of pinch rolls.

If, however, the product is to be given additional rolling immediately after being delivered by the last stand of bar mill rolls, it is conveyed straight ahead for a distance of about 140 feet and charged into a holding furnace which serves the jobbing mill. This furnace is 30 feet long and is equipped with nine motor-driven water-cooled rollers on which the steel travels in and out. It is similar in construction to the one which serves the bar mill and is used for the same purpose, namely, to prevent the dissipation of the initial heat until the piece can be cut into various portions and sent through the mill rolls.

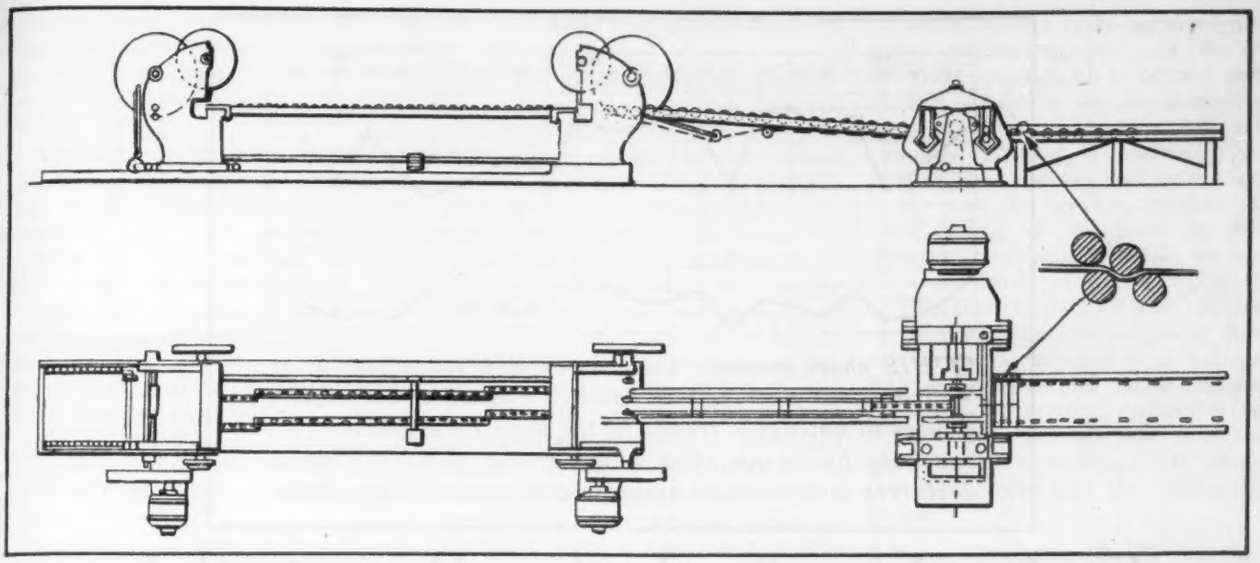
Wide Rolls Employed

The jobbing mill is a 7-stand unit arranged in tandem and the piece always is free of one stand before it enters another. Each of the first four stands is equipped with 2-high rolls, 30 inches in diameter and 58 inches long. The top roll in the first two stands is balanced to prevent its dropping through the thickness of the bar as the pass is completed; the bottom rolls are equipped with a drag. The lower rolls in Nos. 1 and 2 stands are driven at 45 revolutions per minute by a 2000-horsepower induction motor. The motor, which operates at 505 revolutions a minute, transmits its power through a reduction gear, a secondary drive and then through individual shafts coupled to the rolls in question. The same driving arrangement is provided for stands 3 and 4. The delivery speed of the first four stands, therefore, is about 350 feet a minute.

In ordinary jobbing mills only two rolls are used to effect reduction. But in the jobbing mill installation at Ashland 3-high rolls are employed in the last three stands to break down the piece to 16 gage. This arrangement is unique in that reduction is affected only by the bottom and middle rolls. The three rolls each are 58 inches long, the top and bottom rolls being 30 inches diameter and the middle roll 14 inches diameter. In rolling steel it is found that small diameter rolls bite better, that is, they sink deeper into the metal than rolls of larger diameter and reduce the metal quicker. Moreover, they cause less lateral spreading than large diameter rolls and effect the same reduction with a lower power consumption. The purpose of the 30-inch top roll is to strengthen the middle roll and prevent its springing as the sheets are being reduced. Hence, it is known



Plan view of the skew-type feed table installed between horizontal stands Nos. 1 and 2, 3 and 4, and 5 and 6 of the bar plate mill



Side elevation and top plan view of a shearing unit. The circular side trimming shear and the arrangement and position of the feed rolls are shown at the right—Two end trimming shears arranged in tandem and operating simultaneously are shown at the left

in mill parlance as the backup roll. Only the bottom rolls in each stand are driven, the backup roll being driven solely by friction with the middle roll which in turn is driven by friction with the bottom roll.

Roll Speed Varies

When rolling hot metal of comparatively small thickness the rate of cooling is rapid. Therefore the speed of the rolls is increased in the successive stands so that less heat is lost by radiation for a given reduction than if the steel were rolled at a lower speed. Moreover, rolling the steel in one direction increases its length in that direction so that the rate of travel of the reduced piece is higher than the piece entering the roll.

The bottom rolls of this 3-high group are coupled through a secondary drive and a single reduction gear set to an 1800-horsepower motor, its speed being varied by a Sherbius regulating set which operates from 240 to 360 revolutions per minute. By this arrangement the rolls in No. 5 stand can be operated from 43.2 to 64.6 revolutions per minute which is equal to a delivery speed of 340 to 507 feet a minute; those in No. 6 stand from 51 to 66.5 revolutions per minute or from 400 to 600 feet per minute; and those in No. 7 stand from 57 to 85 revolutions per minute or from 444 to 666 feet per minute. The screwdown levers on all of the jobbing mills are operated from a runway which is elevated between each pair of housings and which connects with all stands.

A continuous operating shear, of ½x45-inch maximum cutting range, is installed about 10 feet beyond the discharge end of the holding furnace at the start of the mill. When rolling 16 gage sheets, 44 inches wide and 140 inches long, the irregular front end of the sheet bar is cropped and cuts then are made at intervals of about two seconds until the original bar is exhausted. Uniform lengths are obtained by a stop gage set at a predetermined distance away from the knives.

When the steel arrives at the gap of the rolls in the No. 7 stand of the jobbing mill it is 593 feet from the blooming mill rolls. While traveling this distance it is reduced from a slab 4 inches thick to a sheet bar 7/16-inch thick on the 7-stand bar mill and from a 7/16-inch bar to a sheet 1/16-inch thick or 16 gage on the 7-stand jobbing mill. And in defiance to precedent the entire cycle of reduction is accomplished without any reheating or manual manipulation.

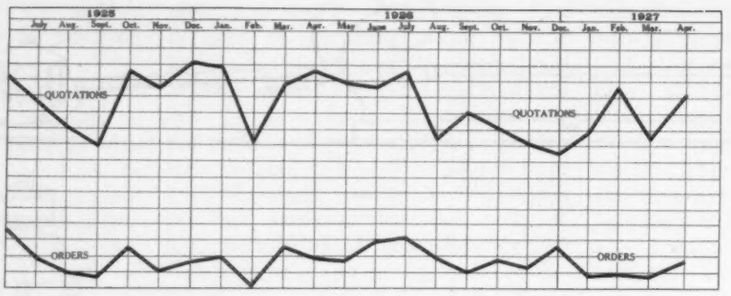
Product Is Inspected

By now the reader may be wondering how the mill crew keeps tab on the length, thickness and weight of the sheets being produced. In other words, how does the roller know that all the mills are in the right adjustment and that the stock being delivered by the last stand conforms to specifications? Within close proximity to the final stand, numerous inspectors are stationed and at stated intervals a sheet is brought to rest and tested with a micrometer for thickness. Shortly thereafter another sheet is gaged for length by a long rod in the hands of another inspector. And finally after another brief interval, during which numerous sheets are passing to the rear of the layout, continually, one at random is lifted from the runout table and weighed by an elevated scale, the operation being performed mechanically. If the inspection discloses a lack of uniformity either in the length, thickness or weight of the sheets being delivered the mill crew is notified by a signal whistle and makes the necessary adjustments indicated by the number of blasts.

Double Head Facilitates Withdrawal of Nail

AFTER considerable experimenting, engineers of the American Steel & Wire Co. have produced a special scaffold nail so designed that it can be driven and drawn several times. The company is producing this nail at Cleveland and later may add it to the products of its western mills. The nail is intended for all uses where a double-head is required, such as for scaffolding, concrete foundation and column forms, or any temporary construction. Because of the double heads, making withdrawal comparatively easy, the nails can be used repeatedly. They are made in sizes 6, 8, 10, 16, and 20 penny, and are packed in kegs of 100 pounds each. They are made plain or coated.

Blacksmiths and mechanics mustered out of the army of Andrew Jackson after the War of 1812 were the first explorers of Alabama mineral lands.



THIS chart presents the inquiry and order line of an individual machine tool builder. Failure of the inquiry figures to anticipate trends in the sales cure indicates the necessity for co-operative action among numerous manufacturers to produce an accurate and comprehensive index.

Is An Inquiry Index Practical In the Machine Tool Industry?

By Robert T. Mason

UNIVERSAL desire of human beings to foresee future events in the case of an individual generally is expressed in nothing more than a wish, but for corporate organizations usually takes form in exhaustive study and research. Data, statistics, analyses, trends and other forms of information are employed by the modern business management upon which to base prognostications for future activities.

That most information now available for forecasting is obtained from and based on current or past developments was shown in IRON TRADE REVIEW, Feb. 17. In that issue an interview with Sheldon Cary, president of the Browning Crane Co., Cleveland, was published. Mr. Cary has evolved a theory that inquiries may be used to indicate probable trends of sales three to six months in advance.

This theory consists in the reporting by numerous companies in many different industries, of inquiries received during a stated period, preferably by months. The inquiries are to be obtained from industries in which the bulk of sales follow the asking of quotations.

Inquiries reported then would be grouped into a lump unit, the various component parts being weighted to obtain accurate relationship. An index figure would be evolved from such an inquiry total, over a period of months the index numbers forming a trend line. To this line could be compared the inquiries and sales of individual companies, showing whether each is receiving a relatively uniform proportion of opportunities to quote and a corresponding percentage of sales. With an index basis of 100, a figure of 105 would indicate increased future business and 95 would foretell decreasing sales.

Theory Attracting Wide Interest

Because of its direct appeal to business executives, the article as published in IRON TRADE REVIEW attracted widespread interest. Various manufacturers expressed willingness to report inquiries. Builders of electric overhead cranes began reporting their inquiries to the department of commerce, and a dollar valuation total was published for October, November and December, 1926, in the *Survey of Current Business*, department official publication.

Changing business conditions in the past few years have made current need buying an accepted and established practice. For manufacturers to cope adequately with fluctuating demand, it is more necessary than previously to maintain an accurate check on the volume of buying, and to anticipate, wherever possible, production requirements. With minimum stocks of materials on one hand and urgent demands for shipment of finished products on the other, a sudden swing in demand is apt to trap manufacturers without sufficient inventory to accommodate possible sales. This situation has caused many interests to seek such a solution as Mr. Cary offers with his inquiry index theory.

A survey of the machine tool industry was made by IRON TRADE REVIEW, as one of the most logical fields for the introduction of the inquiry index as a method of forecasting future trends. Although machine tool executives were not unanimous in their belief that an inquiry index could be effected, all were in accord with the conviction that the benefits would be many.

One of the first problems which was experienced by the machine tool industry in attempting to obtain inquiry information, was an exact definition of what comprises an inquiry. The standardization committee of the Chamber of Commerce of the United States has established a definition that an inquiry is anything that justifies sales effort. Inasmuch as this involves another definition, as to what constitutes sales effort, it is too broad to be used as a basis for reporting inquiries for an index. It has been suggested that an inquiry be termed that request for a quotation that logically might be expected to result in a sale. Machine tool builders can distinguish between a price feeler, information seeker from operator or student, or budget estimator, and an inquiry which justifies a quotation and a salesman's call.

Another point in question, raised by the machine tool builders, is whether a numerical valuation basis should be employed in forming the inquiry figure. The overhead crane manufacturers, in their reports to

the department of commerce, used the dollar valuation basis. This method received preference among the machine tool manufacturers interviewed in the survey.

One factor in the shifting methods of buying is the change in the manner of issuing inquiries. A broader tendency than in the past exists for buyers to concentrate on one type and source of equipment. In such cases, it is not unusal for a buyer to telephone an order to a machine tool builder, without following the older and customary procedure of first issuing an inquiry. Although such a practice is growing, the volume of business transacted in that manner still is of small proportions.

The interval between issuing an inquiry and actual placement of the order varies largely with general business conditions. A lag of several months is customary in some industries, while in others a shorter time is involved. A basis of compensating the variables would be necessary to have the index comprehensively accurate.

Duplicate Inquiries a Problem

In a case where a buyer broadcasts his inquiries to a number of manufacturers another stumbling block is encountered, according to the equipment builders. To rectify this situation provision would necessarily be made to avoid the duplication involved. A common factor could be evolved which would reduce the duplicate inquiries to an average basis. Such a factor would reflect faithfully in an index number any variation in the quantity of inquiries. E. F. DuBrul, general manager, National Machine Tool Builders' association, in discussing the possibilities of inquiry charting as a guide to future activities, suggested that the relation of difference between inquiry and order curves would produce another trend line that might exceed in value as a forecast either of the other curves.

A large builder of machine tools in Cincinnati lends further support to this idea in describing present market conditions. He claims that in a period of hesitant buying, where purchases are postponed until absolutely demanded, the time elapsing between issuance of an inquiry and closing of the sale is reduced considerably. In many cases inquiries are dispensed with and orders placed without asking for quotations. Although such examples are proportionately few, this builder believes that the relationship between inquiry and sales trends is more important than either individually.

But the greatest difficulty in obtaining a relative trend line has not been suggested by the builders. That is the backwardness of machine tool builders to co-operate in a progressive movement where company data of a confidential nature are required. An educational campaign is necessary to convince manufacturers that reporting of inquiries does not divulge any company secrets. This must be accomplished before attempting to encourage the reporting of actual sales figures. Although the department of commerce has consented to undertake the compilation of an inquiry index, numerous companies are unwilling to report to it their monthly totals of inquiries. Such a condition precludes any widespread endeavor at this time to compile sales figures. It is believed by the proponents of the inquiry index idea, that the plotting of a company's sales curve alongside the composite inquiry line will indicate adequately the trend.

Another Cincinnati builder that has employed research and market analysis extensively finds that the greatest demand for machine tools comes apparently in May and September. This company believes that an inquiry curve would not reveal a true forecast. It relies for its guidance on information in charts on seasonal buying, on business by territories, machines, foreign and domestic trade, by inquiries, orders and estimates, by the time required for making estimates, etc.

Seasonal variation in inquiries is an established fact in the power plant equipment field, according to one large manufacturer that has maintained a close check of requests for quotations for the past five years. It finds that October and April are the most active months in its field, and August and June the quietest.

One of the largest builders of machine tools in the United States, producing an extensive line of products, expresses more interest in the relation of orders to inquiries, in its own company, than in the employment of a general inquiry index as a prognosticating aid. The relation of orders to inquiries in this company varies from 18 to 30 per cent depending upon general business conditions. It has worked out a relationship basis for determining whether its sales are holding up to the general inquiry rate. Its experience shows that taking a total number of inquiries over a broad period as 100 per cent, 35 per cent are discarded arbitrarily as price feelers, budget estimators, information seekers from operators, students, publications, etc. Of the 65 per cent remaining, a certain proportion is held up for the succeeding year. Of the number then left, this company estimates it receives 30 per cent in new machine tool orders and 8 per cent in used equipment. In other words, on the basis of 2000 inquiries received, 700 would be cast aside arbitrarily as not justifying intensive sales effort. Of the 1300 remaining, 300 would be eliminated from current consideration due to holdups. This would leave 1000 active inquiries of which the company judges it receives orders for 300 new machines and 80 used installations. It admits that competitors take the rest of the business.

Dealer Reporting Easily Solved

One of the major problems blocking the way for the prompt establishment of a system of inquiry reporting to a central body such as the department of commerce, is the determination of whether manufacturer or jobber shall make the returns. In some lines of machine tool manufacture, direct selling is practiced, while in others the bulk of business is done through dealers. The growing tendency in many lines is to establish direct factory sales offices. Inquiries received by such branches naturally are transmitted promptly to the home office, from which total inquiry reports would be obtained.

Where dealers are involved, a more complicated situation is presented. An equipment jobber or wholesaler may represent from one to a dozen or more manufacturers, and may carry extensive stocks on its floors. In such cases, inquiries are not transmitted to the manufacturer, but are regarded by the dealer in the same light as if received direct by a builder. The dealer usually does not report individual sales to builders. It places orders for a group of machines, either buying outright or taking them on consignment. Such equipment is replaced as sold at the jobber's discretion.

No difficulty is expected to be encountered, however, in establishment of an inquiry index, providing a willingness to co-operate can be obtained from the dealers. Avoiding duplication between manufacturer and dealer is but a matter of selection, in formulating the list of companies upon whose reports such an index would be based. Inquiry reports should be requested from those dealers sufficiently large as to operate independently from the manufacturers, but not from jobbers working in close relationship with builders.

Distributor Plays Essential Role In Modern Business

By A. L. Salt

THE distributor is and has been much in the public eye recently. He has been criticized, he has been maligned, he has been defended. Like Mark Twain's famous statement about the weather, everybody seems to be talking about the distributor but nobody seems to be doing anything about him.

Before I enter into the economic significance of the distributor, there is one point I wish to stress, namely, economic necessity knows no law. If the distributor fulfills a necessary business function in this country and does it better and cheaper than any other known agency, all the arguments and all the discussion in the world will not rule him out. And, too, if he is as some people say, an unnecessary evil, a middleman who fulfills no necessary function, but adds to the cost of business and the cost of living, then anything I might say and all his defenders might say for him, would be for naught because he would be plucked out of the business fabric by the very combination of forces that brought him in.

Distance An Important Factor

The United States is a country of magnificent distances. We little realize and consider less how far flung is American business. Yet these distances in themselves set up barriers and conditions which in turn call forth machinery that is little understood and needed in European countries where the distances from border to border is a New York to Cleveland train ride. The manufacturer in New York who wants to sell his products in 48 states is faced with tremendous sales expense in the form of traveling and living costs and salaries as well as the vexing question of stocks, shipments, service and credits.

The customer who buys iron conduit in Pasadena from the manufacturer in New York is interested quite as much in getting that conduit when and where he wants it as he is in its selling points. The problem of the manufacturer in New York is how to get his conduit to his customers in thousands of Pasadenas when they want it and at a minimum of expense. A distributor with an office in, let us say, Los Angeles, will see that the man in Pasadena will get his conduit when and where he wants it by stocking it in his warehouse, he will have salesmen traveling here, there and everywhere with a catalog that covers not only conduit but everything in the electrical business, thus serving an important function for the man who buys as well as the man who sells. Bear in mind that as long as we have competition we must have salesmen, as long as we have no desire on the part of the buyer to carry large stocks, we must have warehouses on the part of the seller. Whether or not the distributor can do this selling and warehousing cheaper than the maker is a more important question than whether the distributor is or is not a business tyro.

Distribution Regulates Production

Whenever manufacturers get together two subjects generally come in for a great amount of discussion. One is volume production, and the other is specialization, and the two are closely allied.

E. H. Broadwell, vice president and general manager of the Fisk Rubber Co., New York, in a recent interview in *Collier's* said, "The fundamental principle underlying volume production is proper distribution." Mr. Broadwell is quite right. If a distributor can bring a manufacturer's products to the attention of virtually every customer who can buy them, if he can turn over to the manufacturer warehousing and selling facilities all ready made, then he has made it possible for that manufacturer to devote his energies to the specialized job of manufacturing, to volume production, thereby cutting costs in manufacturing, distribution and selling, resulting in lowered prices to the consumer. A manufacturer recently asked us to handle his product. He told us frankly that it would take him years of effort to build up a sales force and a warehouse system to adequately handle his distribution. "You already have a system of distribution," he said, "a system better than I could ever build. You already have salesmen calling on and personally acquainted with the people I must reach. You have efficient credit departments located at your various distributing offices that are in intimate touch with customers and prospective customers in every buying center. I can turn my products over to you, devote my energies to manufacturing, a business I know, and your profits would be much less than my sales expense were I to attempt to do the job." The nation-wide distributor does make it possible for the manufacturer to specialize and produce in quantity.

Selling Cost Varies

An interesting point often overlooked in this question of distribution and its costs is the cost of selling. The distributor's salesman sells many items to many classes of customers. The manufacturer's salesman sells one or a few items to a few customers. Salaries and traveling expenses are about the same. It is evident then, that selling expense spread over many items against a few is less per item in the case of the distributor.

If there were no distributor in the procedure of American business, the manufacturer selling direct to a great number of customers would find his problems greatly complicated unless he were to set up a system of distribution quite similar to that of the distributor. Where the manufacturer sells through the distributor he is dealing with a comparatively small number of accounts which makes his problem of billing and credits a comparatively simple one. Further, his shipping problem is not a difficult one because he is shipping his goods in large quantities to a small number of customers. Without the distributor the manufacturer going direct would find himself confronted with the problem of handling a great number of customers which would mean the handling of a great number of accounts which would in turn greatly complicate the problem of credits as well as add immeasurably to the problem of shipments. All of which is just another way of saying that it would add tremendously to his cost of selling. The manufacturer faced with the necessity of selling his merchandise

The author is president of the Graybar Electric Co., New York. From an address before Congress of American Industry at Philadelphia in September.

to a large number of customers situated in all parts of the country, would likewise find himself faced with the necessity of setting up branch offices and branch warehouses strategically placed to best serve these customers. In other words, he would have to set up a system of distribution which would duplicate that of the present distributor.

There is no question but that the cost of his system of distribution would be higher than the cost of handling his product through an existing distributor due to the fact that in the latter case the distributor is handling his material in conjunction with a number of others which, as I said previously, would spread the expense over the total number of articles handled instead of assessing it against just one.

The reputable distributor who is in a position to economically supply the needs of individual customers around the country, giving the customer material where he wants it and when he wants it, in a position also is to act as an added guarantee of that merchandise. If a consumer knows that a certain type of merchandise which he wants is carried by a reputable distributor, that merchandise carries with it not only the reputation of the manufacturer but the reputation of the distributor, guaranteeing to the user in a double way both its value and its service. It is a fact that the name of a reputable distributor on a product corresponds to the endorsement of a reputable business man on a note.

A large distributor who has contact with a great number of customers in all parts of the country is in position to pick his merchandise. The manufacturer of better types of merchandise is extremely anxious to have the better type of distributor handle his goods, which means, of course, that the reputable and well known distributor is in a position to handle first class merchandise and to give the man who wants it service of a character which measures up to the product itself.

In these days of hand-to-mouth buying, which seems to have come to stay, the distributor fills the important role of a balance wheel. Acting as a reservoir of goods for the manufacturer and the consumer, he helps to level off peaks and enables the manufacturer to keep production more nearly at a steady pace; at the same time, by judicious stocking of that material he is in position to take care of his customers' immediate particular needs of that merchandise at all times.

The large and efficient distributor plays an effective part in the important and much discussed question of costs. Contrary to general belief the distributor effectively keeps down the costs of the commodities he handles. I have pointed out how the distributor's sales, warehouse and credit costs tend to be less than the manufacturer's were he to sell direct those

(*Concluded on Page* 1666)

Iron Ore Output Not Up to Steel Pace in 1926

IN MAGNITUDE of production in 1926 the iron and steel industry recorded a remarkable year, according to the bureau of mines. Production of steel in 1926 was the largest ever recorded and the production of pig iron was only 2 per cent less than the record year. The output of iron ore, however, did not keep pace with the outputs of steel and pig iron, it showing a decrease of about 10 per cent from the year of largest output.

The iron ore mined in 1926 amounted to 67,623,000 gross tons, an increase of 9 per cent compared with 1925. Shipments of iron ore in 1926 amounted to 69,292,832 gross tons, valued at $174,015,645, an increase of 8 per cent in both quantity and total value as compared with 1925. The average value per ton of iron ore at the mines in 1926 was $2.51, virtually the same as the average for 1925. The stocks of iron ore at the mines at the end of 1926 amounted to 9,495,880 gross tons compared with 10,795,630 tons at the end of 1925, a decrease of 12 per cent.

Shipments of ferroalloys of all classes in 1926 amounted to 689,258 gross tons, valued at $61,368,407, an increase of 12 per cent in quantity and of 16 per cent in total value. The production of ferroalloys in 1926 was 674,389 gross tons, compared with 575,455 tons in 1925. This is an increase of 17 per cent for that period.

Production of ferromanganese in 1926 was 318,052 gross tons, averaging 79.25 per cent of magnanese, and containing 252,066 tons of manganese, metal. In the production of ferromanganese in 1926 there were used 619,898 gross tons of foreign manganese ore, 36,309 tons of domestic manganese ore, 488 tons of domestic manganiferous iron ore, 7576 tons of iron ore, and 5122 tons of cinder, scale, and scrap.

The quantity of manganese ore used per ton of ferromanganese made in 1926 was 2.063 gross tons; in 1925 it was 2.133 tons; and in 1924 it was 2.186 tons. Of the foreign manganese ore used in 1926, Russia supplied 282,954 gross tons; Brazil, 237,358 tons; Africa, 42,692 tons; India, 31,667 tons; and the remainder was from Cuba, Chile, and Porto Rico. The quantity of domestic manganese ore used in the manufacture of ferromanganese in 1926 represented only 5.5 per cent of the total manganese ore used.

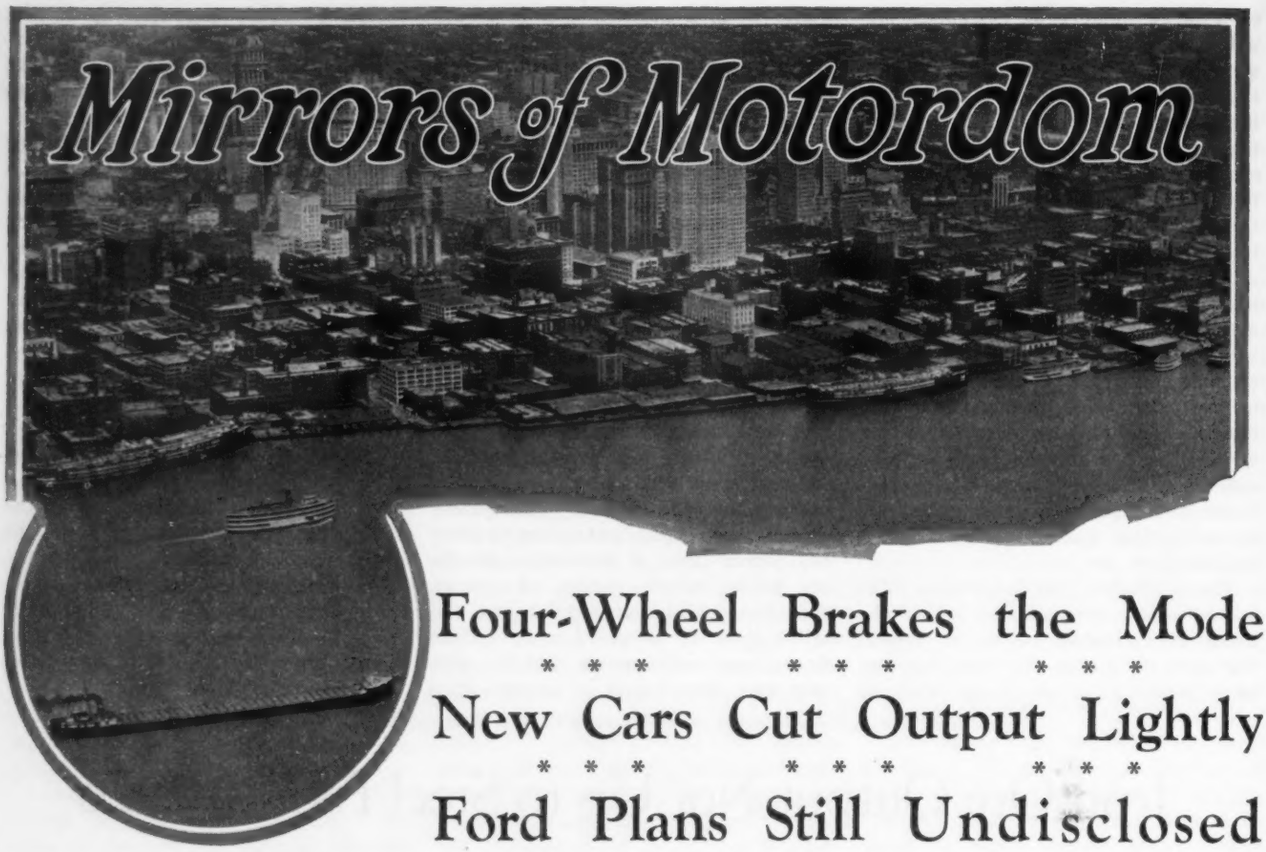
Total Ore Shipments Increased 8 Per Cent

States	1925 Gross tons	1925 Value	1926 Gross tons	1926 Value	Percentage of increase or decrease: Quantity	Percentage of increase or decrease: Value
Alabama	6,891,081	$14,134,677	6,871,412	$13,846,656	— 0.3	— 2
California	352	(*)	282	(*)	— 20.0	.....
Colorado	8,642	(*)	35,535	(*)	+311.0	.....
Georgia	79,488	231,683	51,642	149,198	— 35.0	— 36
Michigan	15,254,003	40,926,315	16,699,984	43,932,982	+ 9.0	+ 7
Minnesota	38,022,237	96,083,485	40,961,361	103,715,621	+ 8.0	+ 8
Missouri	40,043	(*)	124,371	532,536	+211.0	.....
Montana	3,672	10,244	724	1,810	— 80.0	— 82
New Jersey	164,523	678,021	212,152	925,403	+ 29.0	+ 36
New Mexico	172,959	(*)	216,269	(*)	+ 25.0	.....
New York	413,517	1,988,735	659,741	3,015,586	+ 60.0	+ 52
North Carolina	22,011	49,511	14,798	31,645	— 33.0	— 36
Ohio	2,410	(*)	.....	.....	—100.0	—100
Pennsylvania	917,255	2,149,800	1,088,634	2,483,056	+ 19.0	+ 16
Tennessee	164,073	369,144	138,307	312,109	— 16.0	— 15
Utah	268,529	361,251	296,943	411,611	+ 11.0	+ 14
Virginia	76,302	174,454	49,703	162,446	— 35.0	— 7
Washington	830	(*)	1,702	(*)	+105.0	.....
Wisconsin	933,214	2,260,388	1,238,885	3,178,156	+ 33.0	+ 41
Wyoming	489,622	(*)	630,387	(*)	+ 29.0	.....
Undistributed	.....	†1,379,178	.....	†1,316,830	.....	.....
	63,924,763	160,796,886	69,292,832	174,015,645	+ 8	+ 8

*Included under "Undistributed."

†This figure includes value for states entered at (*) above.

The foregoing figures do not include ore containing 5 per cent or more of manganese or ore sold for paint manufacture.



Four-Wheel Brakes the Mode

* * * * * * * * *

New Cars Cut Output Lightly

* * * * * * * * *

Ford Plans Still Undisclosed

Detroit, June 28

FOUR wheel brakes, standard for many months on almost all medium and high price cars, now promise to sweep the low price field. Essex, it is understood, will shortly add them to all models. The new Ford motor is reported so spirited as to require their restraining influence. Overland Whippet has been making much capital out of its four wheel brakes. Competition is expected to force Chevrolet into line. This would make it unanimous in the field priced below $750 and, incidentally, create additional demand for light plates or heavy strip.

* * *

BUICK is approaching its annual model change from a new angle this year. Instead of having only a few display cars out when the word for the fanfare is given it plans to have most of its dealers well stocked. Its July schedule of 30,000 units compared with 18,000 in June reveals the scope of this program. It is understood that compression in the redesigned Buick motor has been greatly increased. The wheels are 2 inches lower and the bodies 3 inches lower than current models. The slope from cowl to radiator is unbroken.

Essex is to bring out at least one new model shortly—a roadster with a rumble seat—and to revamp its current line. There are rumors that Dodge Bros. new light six is only the start of a revision of the Dodge line.

* * *

HENRY Ford continues the soft spot in automobile production in the Detroit district. Were he operating at only a fair rate last year's pace would be exceeded. Those makers who now seem likely in July to approximate their June schedules include Chevrolet, Buick, Packard, Chrysler, Oakland-Pontiac, Hudson-Essex, Cadillac-LaSalle, Reo and Hupp. Among those who are dragging are Paige, Oldsmobile, Lincoln and Studebaker. Dodge has become an uncertain quantity. The popularity of the Essex is second only to that of the Chevrolet and production is being speeded.

* * *

AN ORDER for 800 tons of floor plates, one of the largest of its kind in many months in the Detroit district, which has been placed by the Ford Motor Co. is accepted as an optimistic forecast of its foundry operations.

* * *

SHEET bars rolled at the Ford steel plant are being converted by some of the Ford sources of sheet supply, it is understood. The mills buy the bars, after analysis, and the resulting sheets must pass regular inspection. An effort has been made to roll sheets from the ship plates available through the Ford ship scrapping operation, but this is said not to have proved successful.

* * *

THE automobile industry always has surrounded itself with an atmosphere of great mystery and has profited from the resulting speculation and aroused public interest. Henry Ford is given credit for playing a masterful hand at this game in bringing out the successor to Model T. Not since John and Horace Dodge broke with Henry Ford and started on their own has so much speculation and gossip been provoked. It is all grist in the Ford mill, keeping the public interest whetted while the new car is being shaped up.

Gossip concerning the new Ford is limitless. The cloud to be spied hanging over the Ford airport at Dearborn in the early evening is said to be dust kicked up by test cars. The new engine is said to be so snappy on the getaway that although a Lincoln started at scratch with the new job it was 5 minutes before the Lincoln could pass it. Occasionally it is said that Henry Ford is through running a kindergarten for General Motors customers and will eventually add a medium price car to sell to graduates of the Ford class.

(*Continued on Page* 1666)

New Books Worth Reading

Steel Growth in West

Iron and Steel Industry of the Calumet District, by John B. Appleton, paper, 133 pages, 6x9 inches, published by the University of Illinois, Urbana, Ill., and supplied by IRON TRADE REVIEW for $1.50, postpaid, and in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 7s 6d, net.

A study in economic geography, this volume by the assistant professor of geography of the University of Illinois covers a fertile field. Since the United States Steel Corp. bought its vast tract of sand dunes at the lower end of Lake Michigan on which to build a steel plant in an advantageous location for assembling its raw materials a development perhaps never before witnessed has been taking place there. Considerations leading the Steel corporation to establish its immense plant have actuated others to do the same. Industries needing a supply of steel and an adequate distribution of their products have established their plants in the vicinity. The result is a wide area almost entirely industrial and largely based on steel.

The author obtained his data by field observation, by inquiry from officials of the Calumet plants and by library investigation at Chicago and Washington.

For the most part information is accurate, such slips as are made being due to lack of first-hand information and close association with the industry. Several references to the American Steel & Tube Co. and the American Sheet & Tube Co. are easily recognizable from the text to refer to the Steel & Tube Co. of America. Operation of Federal furnace at South Chicago is attributed to Pickands, Mather & Co., instead of Pickands, Brown & Co. Manganese is referred to as magnesium. Reference to production of limeslag bricks at Cleveland, England, without the latter qualification appended, makes for obscurity.

The author asserts the belief that production at Provo, Utah, will more and more determine the western boundary of the Calumet market. This statement has a singular sound in view of the relative size of that production point and the great plant of the Colorado Fuel & Iron Co., in Colorado, which seems to have escaped his notice entirely.

The volume is a valuable contribution to the history of the industry and especially its western development. That the facts have been gathered and collated before they had been lost in the passing of time is a service to those who come after and write the greater history when development has proceeded further and the Calumet has come into its own.

* * *

Index of Engineering Articles

Engineering Index, published by American Society of Mechanical Engineers, 809 pages 6½ x 9¼ inches, cloth, supplied by IRON TRADE REVIEW for $6 to members of the society and $7 to non-members, and in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 35 shillings, net.

An annual volume, this is part of the service of this society to its members and other mechanical engineers, supplementing the monthly digest of technical literature published in its journal.

The current volume covers 1926 and such numbers of publications for 1925 as arrived too late for inclusion in the preceding volume. Late publications in 1926 likewise will be included in the next volume.

A list of periodicals indexed is given and explanation of the photostatic and translation service rendered by the Engineering Societies Library. A guide to the use of the index makes its application clear.

* * *

Metals in Engineering Study

Metallurgy, by Henry Wysor, cloth, 433 pages, 6x9 inches, published by the Chemical Publishing Co., Easton, Pa., and supplied by IRON TRADE REVIEW for $6, postpaid, and in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 30 shillings, net.

In its third edition, this treatise for students in engineering has been largely rewritten to bring it abreast of later developments of an advancing subject. The author stresses in his preface the importance of a knowledge of metallurgy to all engineering students, as materials of mechanics and construction.

He begins with the winning of metals from the earth and proceeds to a study of their properties as exhibited in manufacturing and testing. Attention is paid to the historical background.

The volume is arranged to concentrate attention on properties and the mechanical and thermal operations by which properties are developed and utilized. Subjects made a part of the work include alloys, casting, metal working, and heat treatment. All metals are included, the rare and noble with those of more utilitarian service. Illustrations and formulas illuminate the text.

* * *

An Aid To Production

Modern Tooling Methods for Turret Lathes, by M. E. Lange, cloth, 126 pages, 6 x 9 inches, published by the Warner & Swasey Co., Cleveland, O., at $1.25 for cloth and 75 cents for paper.

Though small, this volume contains the combined and carefully considered experience of the organization of the Warner & Swasey Co. on the subject of tooling as applied to turret lathes. The effort has been to reduce the practice of tooling to principles, with special emphasis on the differences in tooling between small lot and quantity lot production.

Development of tooling methods for quantity production, in automotive work and similar lines, is not applicable in shops handling a variety of work. Equipment of one machine for one product is not feasible as one machine must be able to turn out a variety of parts. To obtain combined and multiple cuts and rigid tooling, the fundamentals of increased turret lathe production, a plan has been worked out for universal tool equipment, quickly adjustable for a large variety of work, and a permanent setup, to reduce the time of changing from one setup to another, by using the same universal tool equipment.

In this development a complete set of universal tooling equipment has been devised, suitable for the majority of bar work, which may be arranged permanently around the hexagon turret, reducing the setup time for a job to that required for setting and adjusting the cutters.

Bar work and chuck work are discussed, problems being first taken up, typical setups presented and universal tools considered. These steps are

well illustrated in diagram and halftone and the tool user will gain many an idea for reducing his time costs on these machines.

In the final chapter an answer for the small lot producer is offered and another for the quantity producer.

* * *

Reducing Tool-handling Cost

Tool Control, by Anker L. Christensen, cloth, 134 pages, 5¾ x 8¼ inches, published by the Ronald Press Co., New York, and supplied by IRON TRADE REVIEW for $3.50 postpaid and in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 18 shillings net.

Disclaiming effort to break new ground in a subject of which the principles have been known and well defined for years, the author of this new number in the manufacturing industries library of this publisher seeks to apply the accumulated knowledge to the specific problem of an efficient control system for large plants which will be sufficiently elastic to suit the needs of smaller shops.

The material in this volume is compiled mainly from the experience of the author in establishing adequate practice in the plant of the Worthington Pump & Machinery Corp. at Harrison, N. J. In addition, data from others engaged in solution of similar problems have been utilized.

Analysis of the situation in the shop precedes other action. Once the foundation is laid in this process classification of tools can be undertaken the tool crib designed and put into service and tools brought under control. These steps are discussed in sequence. The book then takes up methods of issuing tools, inspection, allocation of cost, executive control and tool development.

The book is well illustrated by sketches of equipment and reproductions of blanks found serviceable in keeping control of tools.

The importance of a system to save time, effort and cost of lost or misplaced tools is evident to every executive and worker who has had to do with a machine shop and the principles developed in this study are of value in building a system for the individual shop.

* * *

Mechanics in a Nutshell

Mechanical World Year Book, by the Mechanical World, Manchester, Eng., cloth, 348 pages, 4 x 6 inches, published by Emmott & Co. Ltd., 65 King street, Manchester, Eng., at 1s 6d, net.

An annual publication, this volume has new sections and some of the older chapters have been rewritten to bring them to date where changes have been rapid. A new section has been added on rails and wheels and one on belt conveyors. The section on toothed gearing has been rewritten and new material added in other departments.

The volume is filled as usual with highly useful information, formulas and engineering data tables, providing for the engineer a compact source of much information frequently required in his work.

Publishes Book on River Transportation

"Our Runaway Rivers—Put Them to Work" is the title of a 52-page book just issued by the Jones & Laughlin Steel Corp., Pittsburgh.

The introduction calls attention to the fact that the nation is aroused by the disastrous floods in the Mississippi valley to the "necessity for compelling the rivers to cease being our masters and become our servants," and points out that the irreparable losses sustained in the flooded areas have stimulated a national determination to make the rivers go to work furnishing transportation, power and light to vast populations in the valley states.

The book is illustrated from photographs showing how the steel and oil companies and other shippers are already putting to work the 9,000 miles of waterways in the Mississippi system for marketing the products of farm, factory, mine and mill, as supplements to the national railway system, not as competitors. The book is one of the most complete on river development in pictorial form ever issued and is being mailed to anyone requesting it.

Mirrors of Motordom

(*Concluded from Page* 1664)

Upon this all agree: Ford engineers at Dearborn have worked up several types of motors, transmissions, clutches and various other key parts. So soon as a decision is made as to which will be adopted, tonnage orders for steel and other materials will begin to flow. Meanwhile, small lots for preliminary use are being placed and immediate delivery is sought. Great stress is being placed on delivery of new machine tools. In some cases tools are being shipped by makers as they are completed and all shipments are traced through.

In the past two weeks many thousands of Ford employes in the Detroit district have been laid off, the estimates running up to 50,000, and it is reported that they will not be called back until August. Ford assembly plants the country over are practically down. It is now doubtful whether the new Ford will be ready for display before August and production attained before late fall.

Distributor Is Important Factor in Business

(*Concluded from Page* 1663)

items that the distributor efficiently handles. Another important point in this connection is that the distributor's large scale buying and his ability to stock material against his hundreds of customers' small requirements, keeping manufacturing production at a nearly level pace, cuts manufacturing costs. These reductions in sales, distributing and manufacturing costs are reflected in lower prices to the ultimate consumer.

In conclusion let me repeat what I said in the beginning: If it is found that the distributor cannot handle merchandise as economically and efficiently as some other agency now in operation or yet to be devised, he is bound to be replaced despite all arguments mere mortals such as I propound and advance. On the other hand, if the efficient distributor can serve the manufacturer and the consumer as can no other agency now known or yet to be devised, he will keep on growing and expanding despite all those who cry out against him can say and do, and in spite of all the arguments those of us who believe in him can advance.

It is a fact that no business in this country grew big and continued over a great number of years to grow bigger, under a system of free competition, unless it served an important and necessary function in the business life of our country. Our business has grown tremendously in the last decade and continues to grow larger, in spite of competition which is ever on the increase. Year after year more distributors enter business and grow. Certainly we distributors must be fulfilling a function better and cheaper than the manufacturer can fulfill it and satisfactorily to our customers or we would not have this record of growth to report. We believe that the distributor is not only a necessary part of our economic life today but is bound to become increasingly more important and it is with the knowledge of service and growth before us that we keep marching on.

Coke pig iron first was made in Alabama at Oxmoor in an experimental furnace in 1876.

Editorials

Bad Precedent Is Side-Tracked

MOTION by a spokesman of the subcommittee on carbon steel castings for high temperature work to refer its proposed specification back to that body for further consideration saved the American Society for Testing Materials, in session last week at French Lick, Ind., from a decidedly embarrassing predicament. In recalling the obnoxious code, the subcommittee not only acknowledged in gracious manner the justice of the opposition's arguments, but it also paved the way for the eventual revision of the specification to eliminate its unwarranted exclusion of crucible and converter steel and to work out the troublesome question of chemical limits.

While the incident undoubtedly is unfortunate in some respects, it has served the good purpose of focusing attention on a fundamental principle of technical society activity—that commercial motives be denied voice in the organization's work.

Although plainly culpable in going so far as to submit the tainted code to the convention, the subcommittee deserves commendation for its eleventh hour decision. The foundrymen—operators of electric and open-hearth, as well as crucible and bessemer steel plants—and their allies also win praise for their valiant stand for principle. Finally the society is to be congratulated for having acted decisively to escape a situation that threatened to undermine the fine work of its 30 years of service to industry.

The Folly of Selling Below Cost

AT THE recent convention of the National Coal association in Chicago the coal operators represented were lectured on the "Folly of Selling Below Cost" by a former official of the United States department of commerce. The remarks of the speaker, Irving S. Paull, would apply to the iron and steel industry as well as the coal industry. The coal men applauded those remarks, but how well they burned themselves into the minds of the hearers has not yet been determined, for shortly afterward some of the operators explained it is cheaper to sell at a slight loss and obtain operating income to help keep their mines free of water and make repairs than to be at a standstill.

When a producer reaches the point where he is willing to dispose of his goods below cost, he is ready to buy an order, not sell it. "Where is the leadership of an industry whose price structure rests upon any such unsound foundation?" the speaker asked. He pointed out that there is only one greater folly than that of disposing of goods below cost—the folly of knowing that situation exists and complaining of it without doing anything about it. The present tendency to disregard costs in order to book orders challenges business and industrial leadership to invoke forceful corrective measures.

Railroads Must Buy Eventually

A SHARP decline in railroad buying of machine tools compared with only a few years ago is indicated by a leading equipment builder, who asserts that investigation reveals that carriers now take approximately 7 per cent of the country's annual total.

To many this figure may prove little short of startling, yet the declining importance of railroad business to the machinery industry has long been indicated in many ways. While finding its principal cause in the rapid growth of certain industrial fields, notably the automotive, it reflects in no small measure a lack of the competitive urge so pronounced in most industrial fields and which inspires the purchase of equipment wherever it can be shown that a dollar can be saved.

Eventually the railroads, which have made such marked strides toward efficiency in other lines, will center more attention on modernizing their shops. Evidences of this, in fact, now are to be seen in the policies adopted at some of the larger railroad shops, and while machine tool builders look for momentum to gather slowly, they in no sense have lost sight of the coming potentialities of the field.

Save at Washington; Spend at Home

NOTHING susceptible to legislative action is so provocative as taxation. The $600,000,000 surplus in the federal treasury and the program of the national administration insure a major role for tax reduction in the next congress. With a special session in October probably forerunning the regular session in December and a presidential election in the offing, the battle doubtless will wage furiously and long.

From the business community of the country

may come proposals not entirely free from self-interest. To expect otherwise would be asking too much of human nature. Business already is suggesting a heavy reduction in the corporation tax. Agrarian interests are for a cut in the lower brackets of the personal income tax, and some suggest that since the tax revision of several years ago failed to bring a lowering of commodity prices the most universal benefit might emerge from application of the treasury surplus toward reducing the national debt.

At this distance conditions are too indefinite to warrant any specific stand. A generality that might not be amiss is that the greatest satisfaction spread horizontally over the taxpaying public would result from moderate reductions in every form of federal levy. Eliminating some levies and leaving others untouched would be a source of unrest.

The relief granted at Washington, however, will be of no moment unless the rising tendency in taxation within state borders is checked. It is comparatively easy to bring pressure upon congress; meanwhile the state, county, municipal, township and district authorities pile levy upon levy. Industry, being the largest taxpayer, should be the most alert in this matter.

Veto Proves Self-Help Wins

THE fallacy that governmental price fixing is the panacea for the agricultural ills of the country has never been more thoroughly exposed than in the course of farm product prices in the past 90 days.

Since President Coolidge shortly before adjournment of congress March 4 vetoed the McNary-Haugen farm relief measure the tendency in farm products has been upward. In wheat, corn and cotton has this been particularly true and these important commodities are now at the highest point of the year.

As Lewis E. Pierson, president of the chamber of commerce of the United States, has put it in a letter to the President, the depression "so largely created by long continued agitation for price fixing legislation, has entirely passed away. . . . The national chamber has a great hope that we have finally passed through that period when unsound panaceas of governmental price fixing and entry into the field of private enterprise can be seriously contemplated by the American people."

The iron and steel industry prefers to settle within its confines whatever price difficulties that beset it, and the wisdom of such a policy for all industry seems to be substantiated by the recent recovery in agriculture.

What Our Readers Are Thinking

For a Tariff on Manganese Ore

To the Editor:

APPLICATIONS have been filed with the tariff commission for both an increase and a decrease in the tariff on manganese ore. The commission has just recently announced that it has ordered an extensive investigation of the manganese situation of the United States.

Propaganda against the tariff is being spread at large; representations are being made that there is no manganese in America and reports on file with many of the government departments in Washington are to the effect that there is no manganese in the United States.

A considerable amount of American capital has been invested in manganese developments in Russia and Africa. The increasing developments in manganese in this country are a source of alarm to the foreign shippers.

The United States consumes approximately 800,000 tons of manganese ore per year. The production from domestic mines in 1914 was 2635 tons; in 1918 it rose to 305,869 tons; the production in 1922 was 13,404 tons. Due to the tariff in the last few years widespread developments have gone forward. In 1925 the recorded shipments were 98,324 tons. Several large developments are now on the eve of production and foreign producers have awakened to the facts.

Opponents of the tariff are putting out propaganda that there is no ore in the United States and at the same time are leading others to believe that the present mining is depleting the reserves. The total positive reserve in the United States is only 1,493,200 tons according to the opposition. Opponents fail to show that mines of the United States have already shipped more than 1,493,200 tons of high-grade manganese ore and that the deposits have hardly been scratched. They fail to show that various developments under the encouragement of the tariff have shown reserves 10 to 50 times greater than was estimated to exist and that new discoveries are being reported month by month.

The manganese tariff increased the cost of a ton of finished steel product only 16 cents. This was apparently absorbed by the steel companies and was in no appreciable way reflected in products sold to the public. The tariff is refunded to the steelmakers when the steel is used for export. It works no recognized hardship on any industry or class except the foreign producers.

But the tariff follows a firm principle and is justified because it means a good source of revenue to the United States Government; it encourages the development of the manganese resources of America; it adds to our national wealth; it furnishes employment to thousands of men engaged in the development, mining, milling and transportation of the product and most important of all it assures a dependable source of supply of this most essential material during a period of war or emergency.

The tariff commission has been led to believe there is little if any ore in the United States. For this reason it may be inclined to remove rather than increase the tariff. The situation is acute and must not be underestimated.

J. CARSON ADKERSON, *Consulting Engineer.*
Woodstock, Va., June 20, 1927.

IRON TRADE REVIEW

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MORE steel was absorbed in the automotive industry in 1926 than by any other group except the railroads. Because of the industry's importance to iron and steel manufacturers, and by reason of its general influence on business, IRON TRADE REVIEW is inaugurating a new feature, a budget of news reflecting its operating conditions and prospects. "Mirrors of Motordom," written by a staff correspondent from personal investigations in Detroit, will be found on page 1664, this issue. Similar articles will appear at frequent intervals.

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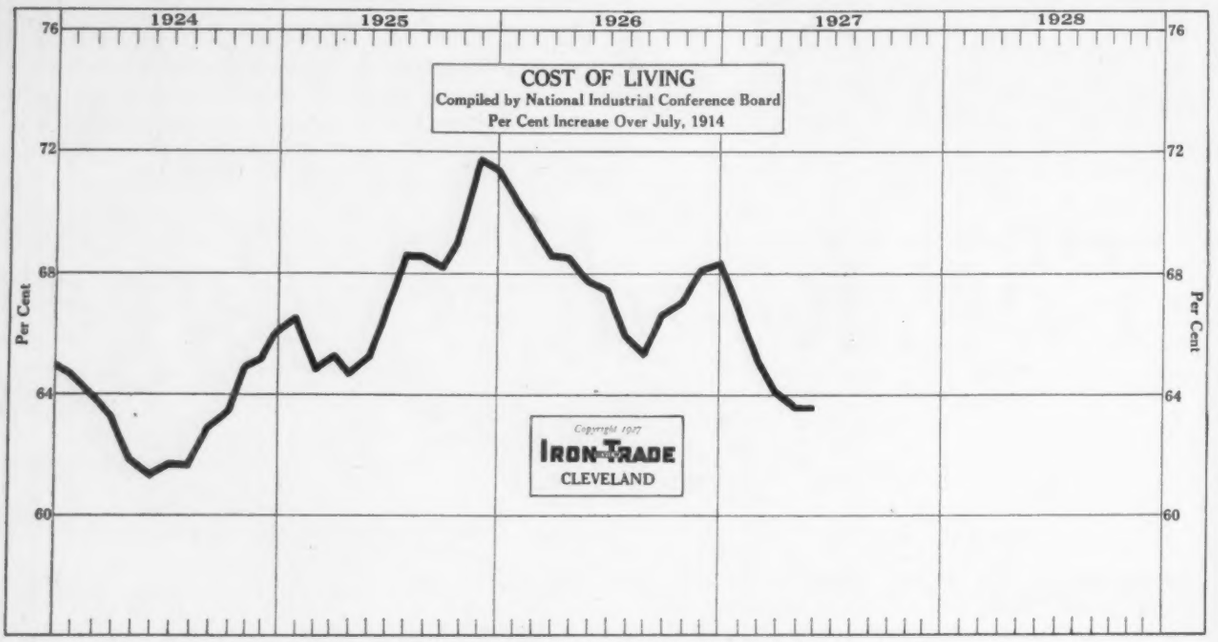
The Business Trend



Dollar's Purchasing Power Higher

By JOHN W. HILL. Financial Editor

THE purchasing value of the dollar as measured by living costs for the American wage earner and other persons of moderate means, stands higher today than it has at any time within two years. Upon the basis of present living costs the dollar is now worth 61.1 cents as compared with the 1914 dollar. The worth of the dollar struck its lowest ebb in July, 1920, when it stood at 48.9 cents.

THE cost of living index, computed by the national industrial conference board, was 163.7 for the month of May. This means that average living costs were nearly 64 per cent higher than they had been in 1914. In May, 1926, they were about 68 per cent over the pre-war average level and in May, 1925, they were 65 per cent above 1914. The May index was the lowest of any May since 1924.

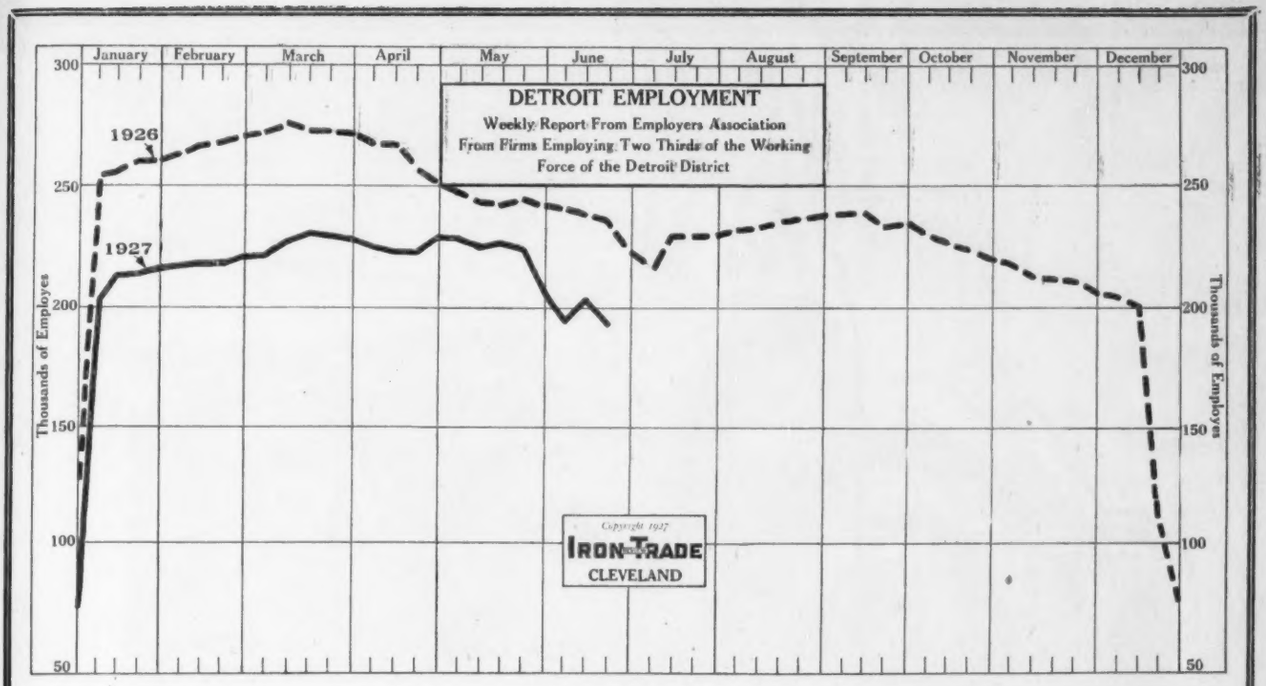
WHILE average living costs have been declining average weekly earnings of industrial workers have continued to hold firm or to advance. Meanwhile employment has been relatively steady throughout most industries. At present weekly earnings are more than twice as high as they were in 1914.

AS A result of this doubling in wages the wage earner draws a weekly pay of about 34 per cent greater purchasing power than he did just before the war in spite of higher living costs. This high level of buying power on the part of industrial workers is one of the great sustaining influences of industrial activity.

IN ADDITION, since the first of the year the purchasing power of farmers has been materially increased. This has been accomplished through the substantial gain in prices of farm products at a time when industrial products, in the main, have been weak. As a result the large gap existing between the level of industrial prices and that of agricultural prices has been lessened and unless there are wholesale crop failures this should benefit the farmer.

THE cost of living items which have had the most pronounced recent decline include shelter, clothing and fuel. Shelter, meaning rents, is now about 71 per cent over the 1914 level. This compares with a peak of 86 per cent over the 1914 level reached in 1924. Clothing is 72 per cent over the 1914 level compared with 75 per cent above prewar one year ago.

The Business Trend

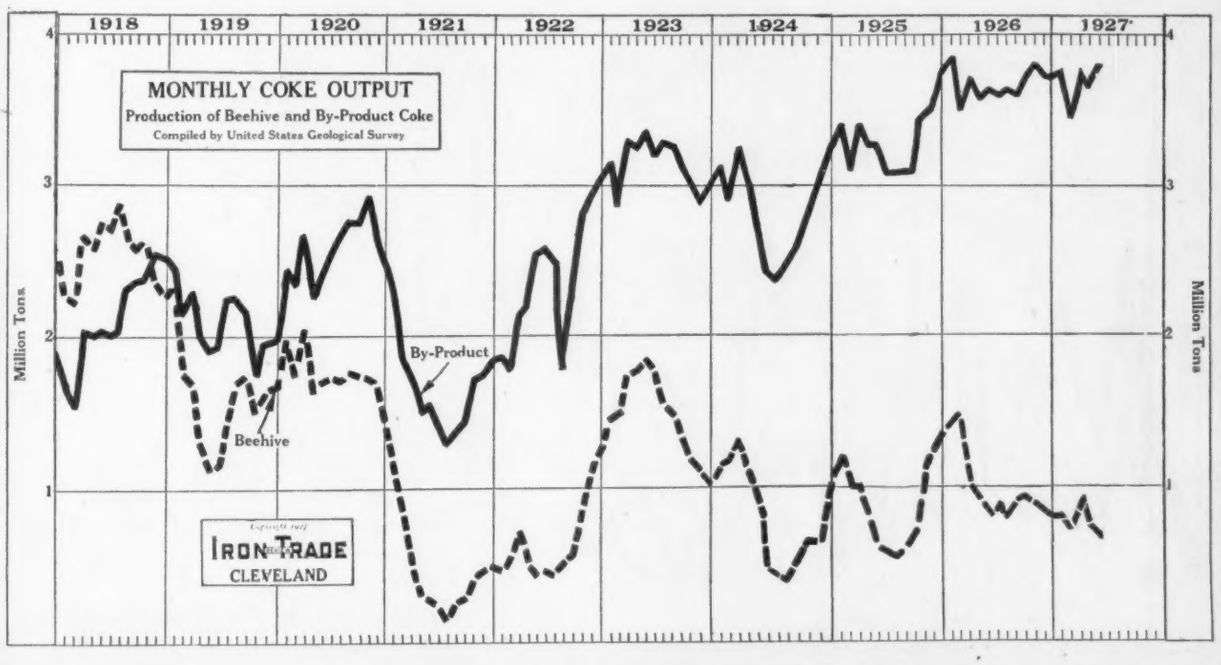


Detroit Employment

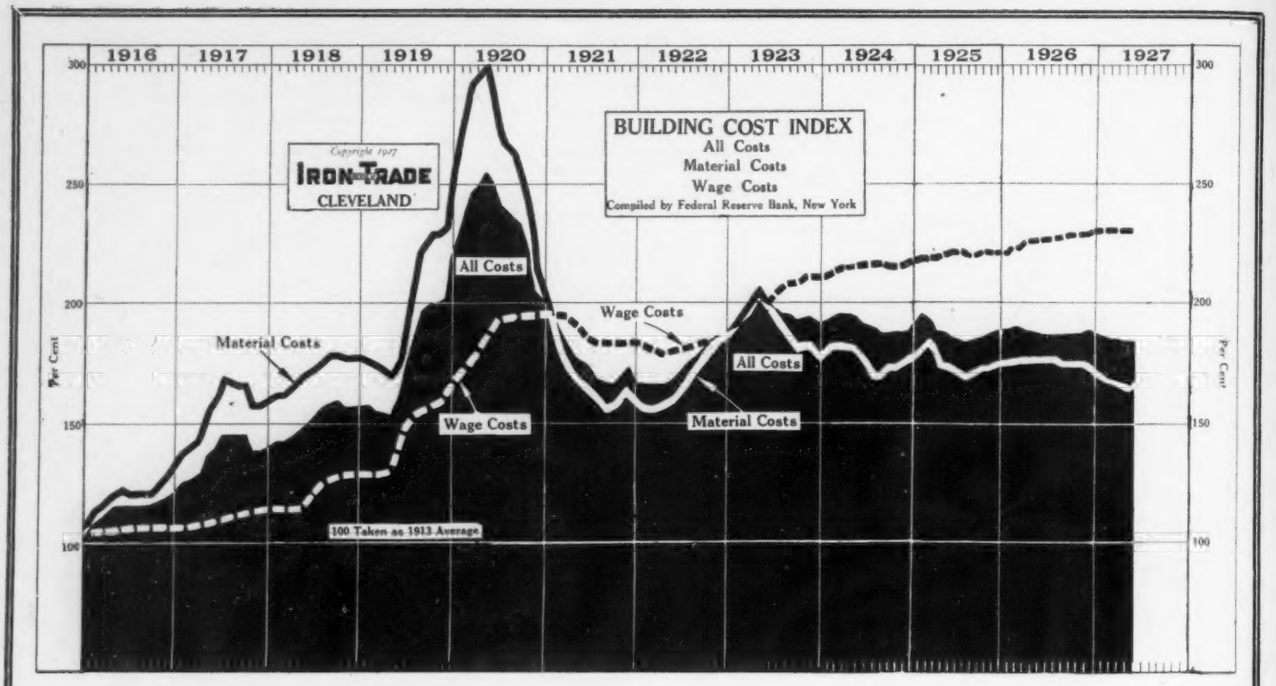
EMPLOYMENT in the Detroit district has sunk to the lowest point of any time since the depressed period in the automobile industry last December. The total employment reported in the week ended June 21 was 191,303. This was a decline of 13,663 from the preceding week. Compared with the corresponding date one year ago, it was a decline of nearly 46,000. The recession reflects curtailment in large automobile plants preparatory to the introduction of new models.

Monthly Coke Output

THE output of by-product coke for May amounted to 3,792,000 tons, an increase of 85,000 tons or 2.2 per cent compared with April. This figure was the largest ever shown for any May, being 1.4 per cent and 15.6 per cent higher than for May, 1926 and 1925 respectively. The output of bee-hive coke during May declined sharply compared with April. The estimated total was 630,000 tons a decrease of 150,000 tons or 19 per cent. The output of all coke was 4,422,000 tons of which 86 per cent was by-product.



The Business Trend

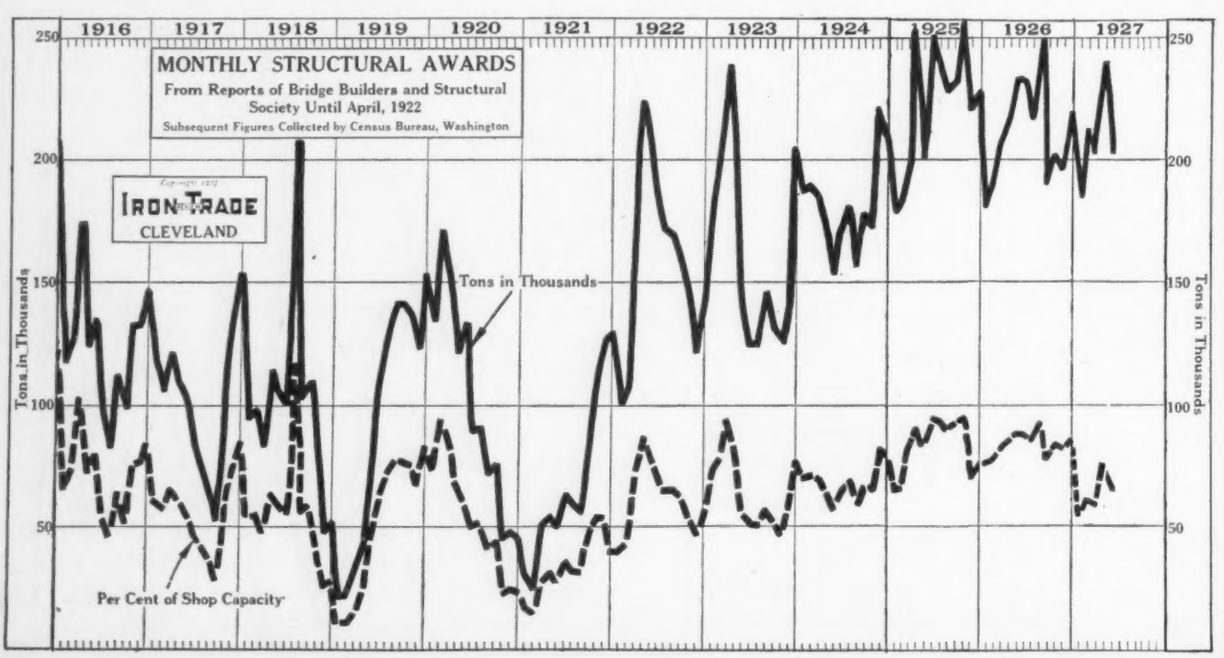


Building Cost Index

BUILDING costs continue to hold relatively steady, chiefly due to the high and firm level of wage rates. The cost of building index as computed by the federal reserve bank of New York, stood at 191 in May, no change from the preceding month and compared with 194 in May, 1926. The cost of materials stands at an index of 166 as compared with 165 in April and with 172 one year before. The wage index is 229 compared with a like figure for April and with an index of 227 in May, 1926.

Structural Awards

SOME further slackening in the rate of building activities is reflected in the record of structural awards for May. Computed tonnage of awards during the month was 206,700 tons compared with 241,680 tons in April and 235,320 tons in May, 1926. Awards represented 65 per cent of capacity as compared with 76 per cent in April and 74 per cent one year before. Total five months bookings were 1,046,000 tons compared with 1,039,000 tons reported one year before.



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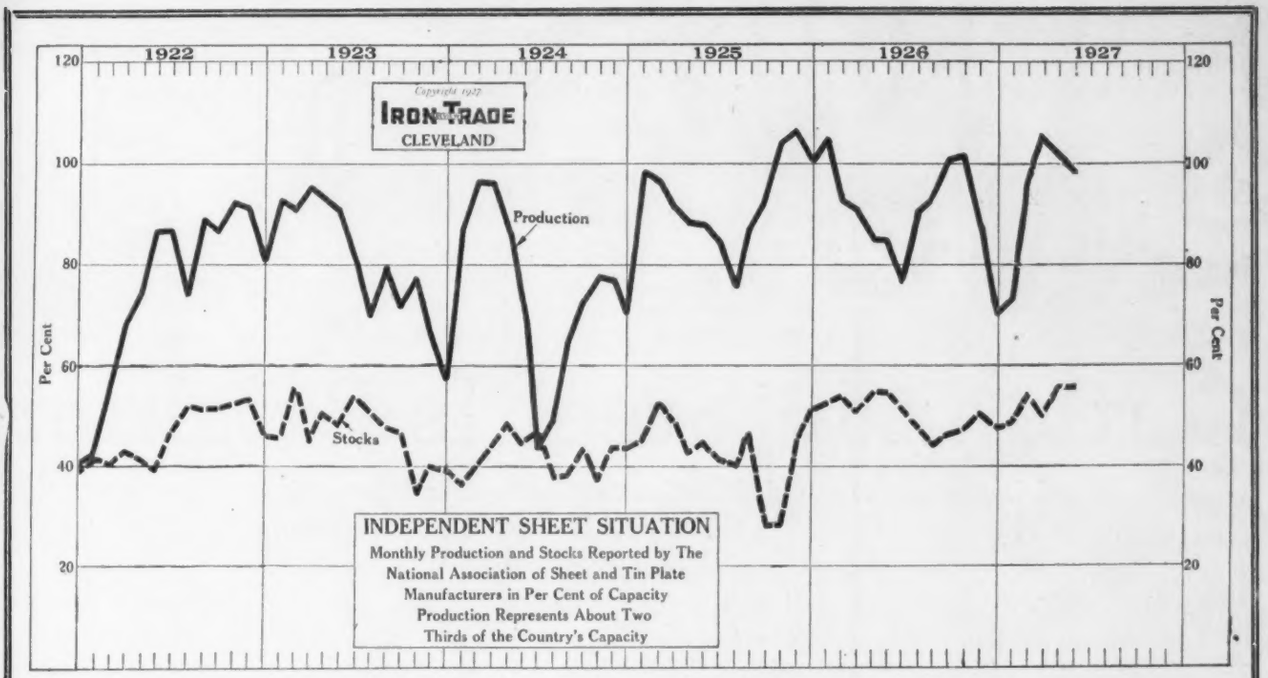
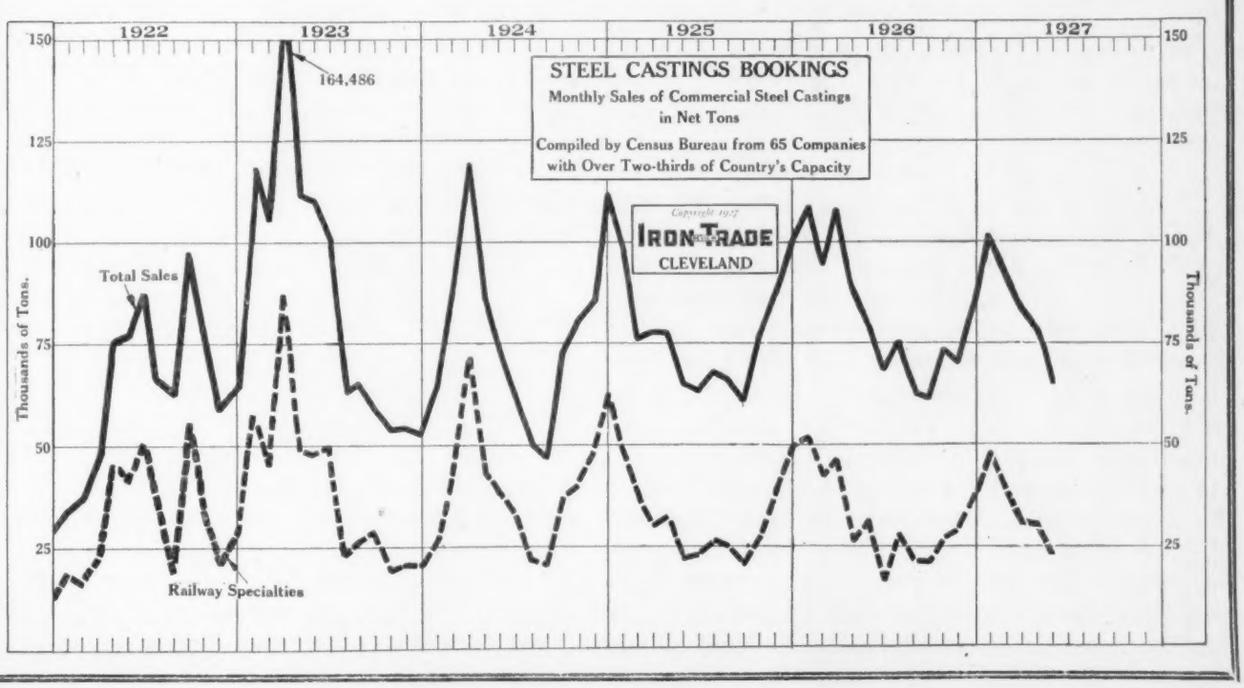


Independent Sheets

SHIPMENTS of sheets during May were about 2000 tons higher than they were during the preceding month and 35,000 tons higher than they were in the corresponding month one year ago. Total production in May was 98.7 per cent of mill capacity, compared to 103 per cent in the preceding months. Sales were 67.7 per cent of capacity as compared with 95.6 per cent in the preceding month. Sales of 212,000 tons in May compared with 201,000 tons in May, 1926.

Steel Castings Bookings

BOOKINGS of steel castings in the United States as reported to the department of commerce by leading manufacturers for May were 50 per cent of shop capacity. This compares with 59 per cent in April and 61 per cent one year ago. May bookings totaled 66,425 tons against 78,282 tons in April and 80,800 tons in May, 1926. Railway specialty bookings represented 41 per cent of shop capacity against 52 per cent one month before and 52 per cent 12 months before.



Outlook in Steel Is Brighter

Railroad and Implement Demand, Plus Greater Strength in Prices, Makes New Quarter More Promising—Operating Rates Feel Holiday Cut—Pig Iron Is Dull and Weak—Sheet Prices Holding—Semifinished Sales Better

PRODUCTION of iron and steel still tends downward as the third quarter opens but the prospect before the industry has brightened measurably. Operations will be suspended over the July 4 holiday and a few producers may be down the entire week. Some consumers, planning to close next week for vacations and inventory-taking, have held up shipments until the week of July 11. Steelmaking operations for the country have receded from 74 to 70 per cent.

Encouragement comes chiefly from the railroads and manufacturers of farm implements. Secondary rail inquiry has mounted to 175,000 tons, plus 40,000 tons of track fastenings. Many roads are taking bids on their third quarter requirements for various steel products. Implement makers, looking to their fall runs, are specifying finished steel more freely, especially at Chicago. Some steel producers having a full range of products experienced a slight increase in their aggregate bookings last week. These favorable conditions should be reflected in mill operations after mid-July.

Steel Prices Are Firmer

While weakness characterizes the greater portion of the pig iron market, finished steel prices evidence strength. Plates, shapes and bars have remained stationary at 1.80c, Pittsburgh, the past week with further third quarter contracting at this level; the lowest bid on the Pennsylvania railroad's third quarter requirements of 25,000 tons was 1.80c, base, mill, and 2.00c, Chicago. Sheets continue to display marked firmness in all markets. Strip is holding generally. Some makers of nails, barbed wire and staples are attempting to recoup the recent $1 reduction, although in some districts wire products are weak. Pipemakers are taking off capacity rather than cut their prices.

Beehive furnace coke is a trifle easier, now being quoted at $2.85 to $3.25. Small operators have offered spot furnace as low as $2.85. Further third quarter contracting has been on the basis of $3.25, the maximum furnaces will pay.

Pig Iron Is Weakening

Apathy of pig iron consumers toward their third quarter needs is having a depressing effect on prices. Basic has been sold at $17.50, valley, a drop of 50 cents, while even less is reported. Bessemer is also down 50 cents in the Mahoning valley, and malleable 25 cents. Foundry and malleable iron at Buffalo are down to a base price of $17.50. Both Granite City and Ironton report reductions of 50 cents to $1. Pig iron sales, while increasing, fall below normal for opening of third quarter.

Semifinished material for July and August delivery is more active. Forging billets are off $1, to $39, Pittsburgh. On some semifinished orders makers are absorbing the freight.

Bars are the leaders of the heavy steel lines at both Pittsburgh and Chicago. New inquiry for oil storage tanks requires 8000 tons of plates. Fabricated structural steel awards hold to the seasonal normal.

Exports and Imports Up

May foreign trade figures in iron and steel reveal a less favorable balance than in preceding months. Exports maintained the rising tendency of the past four months but imports reversed themselves and more than neutralized the gain in exports. This situation is due largely to increased receipts of pig iron from British India. May exports at 202,708 tons showed a gain of 10,000 tons over April and 30,000 tons over last May. Imports in May totaled 79,814 tons, compared with 60,374 tons in April and 108,781 tons last May.

The Market Section

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	June 29, 1927	May, 1927	Mar., 1927	June 1926
PIG IRON				
Bessemer, valley, del., Pittsburgh	$20.26	20.86	21.16	20.76
Basic, valley	17.50	18.10	18.50	17.75
Basic, eastern del., eastern Pa.	20.75	20.75	21.00	21.75
*No. 2 foundry, del., Pittsburgh	19.51	20.26	20.16	19.76
No. 2 foundry, Chicago	20.00	20.00	20.00	21.10
*Southern No. 2, Birmingham	18.00	18.00	18.00	21.00
*Southern Ohio, No. 2 Ironton	20.00	20.00	20.00	19.50
**No. 2X, Virginia furnace	22.00	22.00	22.00	23.00
**No. 2X, eastern, del. Phila.	22.01	22.26	22.26	22.76
Malleable, valley	17.75	18.50	18.40	18.00
Malleable, Chicago	20.00	20.00	20.00	21.10
Lake Superior charcoal, del. Chicago	27.04	27.04	27.04	29.04
Gray forge, val., del., Pittsburgh	19.01	19.76	19.66	19.26
Ferronmanganese, del., Pittsburgh	94.79	98.54	104.79	92.79
*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.				
COKE				
Connellsville, furnace, ovens	2.85	2.80	3.30	2.70
Connellsville, foundry, ovens	4.00	3.80	4.15	3.75
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	33.50	34.00	35.00	36.00
Sheet bars, open-hearth, Pittsburgh	33.50	33.75	34.00	36.00
Billets, open-hearth, Pittsburgh	33.00	33.00	33.60	35.00
Wire rods, Pittsburgh	42.00	42.00	43.00	45.00
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.80	1.85	1.90	1.90
Steel bars, Chicago	2.00	2.00	2.00	2.10
Steel bars, Philadelphia	2.17	2.17	2.22	2.22
Iron bars, Philadelphia	2.22	2.17	2.22	2.22
Iron bars, Chicago	2.00	2.00	2.00	2.00
Shapes, Pittsburgh	1.80	1.85	1.90	1.90
Shapes, Philadelphia	2.07	2.12	2.12	2.22
Shapes, Chicago	2.00	2.00	2.00	2.10
Tank plates, Pittsburgh	1.80	1.85	1.90	1.90
Tank plates, Philadelphia	2.12	2.17	2.22	2.22

	June 29, 1927	May, 1927	Mar., 1927	June, 1926
Tank plates, Chicago	2.00	2.00	2.00	2.10
Sheets, black, No. 24, Pittsburgh	3.00	2.90	2.90	3.10†
Sheets, blue anl., No. 10, Pittsburgh	2.25	2.25	2.20	2.35
Sheets, gal., No. 24, Pittsburgh	3.85	3.80	3.70	4.30†
Sheets, black, No. 24, Chicago	3.15	3.10	3.00	3.35†
Sheets, blue anl., No. 10, Chicago	2.40	2.40	2.35	2.55
Sheets, galvanized, No. 24, Chicago	4.00	3.95	3.90	4.55†
Wire nails, Pittsburgh	2.50	2.55	2.55	2.65
Wire nails, Chicago	2.55	2.55	2.60	2.70
Tin plate per base box, Pittsburgh	$5.50	5.50	5.50	5.50
†Based on No. 28 gage.				
OLD MATERIAL				
Heavy melting steel, Pittsburgh	14.75	15.50	16.40	15.85
Heavy melting steel, eastern Pa.	14.25	14.35	14.75	15.25
Heavy melting steel, Chicago	12.00	12.35	13.05	12.65
No. 1 wrought, eastern Pa.	16.75	16.75	17.65	17.00
No. 1 wrought, Chicago	12.00	12.75	13.50	12.65
Rails for rolling, Chicago	14.50	15.10	15.50	15.10

Composite Market Average

The Fourteen Leading Iron and Steel Products Included are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (June 29, 1927)	$36.50
Last week (June 22, 1927)	36.65
One month ago (May, 1927)	36.76
Three months ago (March, 1927)	36.83
One year ago (June, 1926)	37.69
Ten years ago (June, 1917)	82.66
Fourteen years ago (June, 1913)	26.78

Heavier demand for sheets is reported in practically all districts, although automotive consumption is not expected to regain its stride until mid-July. Ten more independent mill units are operating in the Mahoning valley this week.

Iron and steel scrap prices continue weak but in some districts dealers have begun to accumulate stocks, possibly an indication that the bottom has been reached.

Contracting for cold finished bars at 2.30c, Pittsburgh, is fairly liberal.

Due almost entirely to weakness in pig iron, the IRON TRADE REVIEW composite of fourteen leading iron and steel products receded 15 cents to $36.50. This compares with an average of $36.76 for May and $37.69 for last June.

Late News Flashes

No. 2 Stack At Ohio Work Blown Out

Youngstown, O., June 28.—No. 2 stack of Carnegie Steel Co. at the Ohio works was blown out Saturday, leaving four blast furnaces at this plant on the active list and 23 of the 39 stacks in the district.

May Malleable Castings Output Declines

Washington, June 28. — Production of malleable castings in May dropped to 57,655 tons from 59,225 tons in April, according to 134 manufacturers reporting to the department of commerce. Shipments and bookings also fell. Plant capacity operated in May was 54.1 per cent compared with 55.8 per cent in April.

Defer Dismissing Bethlehem Merger Complaint

Washington, June 28.—After an all-day executive session the federal trade commission without a record vote decided to defer action for the present on the dismissal of the Bethlehem Steel Corp. merger complaint. B. B. Bane, attorney for the commission in the case, was called to discuss the legal aspects. The commission will make no official statement at this time. Dismissal of the case has been considered a possibility since the Supreme Court limited the scope of the commission in the Eastman Kodak case.

American Buys Detroit Copper & Brass

Detroit, June 28. — Assets and business of Detroit Copper & Brass Rolling Mills today was acquired by American Brass Co., Waterbury, Conn., subsidiary of Anaconda Copper Mining Co., New York. The Detroit company will be operated as a branch of the American company. Details have not been made public but it is rumored that Arthur Quigley, formerly of the Toronto plant of the American company, will manage the newly-acquired property. Sale of the plant was approved by stockholders today and it is understood between $12,000,000 and $15,000,000 was involved. The Detroit company is the pioneer brass producer in the Middle West.

Current Rolled Steel Prices

PRICES, CENTS PER POUND, UNLESS OTHERWISE STATED

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$33.00
Pittsburgh, bessemer	33.00
Youngstown	33.00
Cleveland	33.00
Philadelphia	38.30 to 39.30
Chicago	35.00
Forging, Pittsburgh	39.00
Forging, Philadelphia	44.30

SHEET BARS

Pitts., Young., and Cleve.	$33.50 to 34.00

SLABS

Pitts., Young., and Cleve.	$33.00

WIRE RODS

Pittsburgh	$42.00 to 43.00
Cleveland	42.00 to 43.00
Chicago	42.50 to 43.00

Standard extras, $5 for screw stock: $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

All grades, Pittsburgh	1.80c to 1.90c

Standard Structural Shapes

Pittsburgh	1.80c to 1.85c
Philadelphia	1.90c to 2.12c
New York	1.99c to 2.14c
Chicago	2.00c
Cleveland	1.99c to 2.04c
Birmingham	1.95c to 2.00c
Pacific coast, c.i.f.,	2.35c

Steel Plates

Pittsburgh	1.80c to 1.85c
Philadelphia	2.07c to 2.17c
New York	2.09c to 2.19c
Chicago	2.00c
Cleveland	1.99c to 2.04c
Birmingham	1.95c to 2.00c
Pacific coast, c.i.f.,	2.30c

Iron and Steel Bars

Pittsburgh, soft steel	1.80c to 1.85c
Pittsburgh, cold finishing	1.95c to 2.00c
Pittsburgh, forging quality	1.95c to 2.00c
Philadelphia, soft steel	2.12c to 2.22c
New York, soft steel	2.14c to 2.24c
Chicago, soft steel	2.00c
Cleveland, soft steel, mill	1.85c to 1.90c
Cleveland, soft steel, del.	1.90c to 2.04c
Birmingham, soft steel	1.95c to 2.00c
San Francisco, soft steel	2.35c to 2.40c
Pittsburgh, refined iron	2.75c to 4.25c
Pittsburgh, reinforcing billet	1.80c to 1.85c
Chicago, reinforcing billet	2.15c to 2.55c
Chicago, reinforc. rail steel	2.00c to 2.50c
Youngstown, reinf. billet, base	1.90c to 2.00c
Chicago, rail steel	1.90c
Mill, rail steel	1.65c to 1.75c
Philadelphia, common iron	2.12c to 2.22c
New York, common iron	2.14c to 2.24c
Chicago, common iron	2.00c

Hoops, Bands, Strips

Hoops, Pitts., 6 in. and under	2.30c
Bands, Pitts., 6 in. and under	2.30c
Bands, Pittsburgh, over 6 in.	2.10c
Hot rolled strip, Pitts, stamping quality, over 6 in.	2.10c
Hot rolled strip steel, Chicago	2.30c to 2.60c
Bands, Chicago, under 6 inches	2.50c to 2.60c
Bands, Chicago, 6 in. and over	2.30c to 2.50c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base, Pittsburgh, Cleveland	3.25c
Worcester, Mass.	3.40c
Chicago	3.25c to 3.40c
Stripsheets, 12 in. and wider, Pitts.	3.00c

Cold Finished Steel

Cold finished steel bars, drawn, or rolled, Pitts., Chi., c.l.	2.30c
Steel shafting, Pittsburgh, Chi.	2.30c
Cold finished steel bars, Cleve.	2.35c

Chain, Piling, Cut Nails

Cut nails, c. l., f.o.b. Mills	2.80c
Chain, 1-in. proof coil, Pitts.	6.00c
Sheet piling base, Pittsburgh	2.20c to 2.25c

Alloy Steel

Hot Rolled

F.o.b. Pittsburgh or Chicago

S.A.E. Series Numbers	100 lbs. Bars
2100 (*½ per cent NI. 0.10 to 0.20 per cent C	$3.00 to 3.10
2500 (5 per cent nickel)	5.30 to 5.50
3100 (Nickel chromium)	3.30 to 3.40
3200 (Nickel chromium)	4.75 to 5.15
4100 (Chromium molybdenum)	3.30 to 3.40
4100 (Ch. mol. 0.25-0.40)	4.00 to 4.15
4615 (Ni. molyb. 1½. 0.10-0.20 molyb.)	4.25 to 4.50
5100 (Chrom. steel)	3.30 to 3.40
6100 (Ch. Van. Forg.)	4.10 to 4.20
6100 (Ch. Van spring)	3.60 to 3.80
9200 (Silico Mang., spring steel)	3.20 to 3.20
9250 (Silico Mang., spring steel)	3.10
N. C. V., (1½% Ni. 1% Chr., Van. 15)	4.25 to 4.35

*Mill number not formally accepted by S. A. E.

Hot rolled alloy billets 4 x 4-inch and over take the same prices per gross tons as same specification of alloy bars per net ton. Sizes from 4 x 4-inch down to 2½ x 2½-inch take same basis plus $5 a ton extra. Billets smaller than 2½ x 2½-inch take bar price on net ton basis.

Cold Rolled

Cold rolled alloy steels take 1c a pound extra over hot rolled when mean carbon is 0.30 or under. When the carbon is above 0.30 the extra for cold rolled is 1.75c, including annealing.

Sheets

SHEET MILL BLACK

No. 24, Pittsburgh base	3.00c
No. 24, Philadelphia, delivered	3.32c
No. 24, Gary, Indiana Harbor	3.10c
No. 24, Chicago, delivered	3.15c
No. 24, Birmingham, base	3.10c to 3.15c

TIN MILL, BLACK

No. 28, Pittsburgh	3.10c
No. 28, Gary base	3.20c

GALVANIZED

No. 24, Pittsburgh base	3.85c
No. 24, Philadelphia, delivered	4.17c
No. 24, Gary, Indiana Harbor	3.95c
No. 24, Chicago, delivered	4.00c
No. 24, Birmingham, base	3.95c to 4.05c

BLUE ANNEALED

No. 10, Pittsburgh, base	2.25c
No. 10, Philadelphia, delivered	2.57c
No. 10, Gary, Indiana Harbor	2.35c
No. 10, Chicago, delivered	2.40c
No. 10, Birmingham, base	2.35c to 2.45c

AUTOMOBILE

No. 20, Pittsburgh, base	4.25c

IRON

No. 10, Pitts., blue ann., c.l.	2.90c
No. 24, Pitts., Box annealed, one pass cold, carload	3.85c
No. 24, Pitts., gal., c.l.	4.85c

Tin and Terne Plate

Prices per 100-pound box, Pittsburgh

*Tin plate, coke base	$5.25 to 5.50

Gary, Ind., base 10 cents higher.

Long ternes, primes, No. 24	4.20c

*Price subject to quantity differentials.

Wire Products

To Jobbers in Carloads

Dealers 5 cents per 100 pounds extra

F.O.B. Cleveland and Pittsburgh base

Bright plain wire, No. 9 gage	2.40c
Annealed fence wire	2.55c
Galvanized wire, No. 9 gage	3.00c
Barbed wire, painted	2.95c to 3.00c
Barbed wire, galvanized	3.20c to 3.25c
	Per 100 lbs.
Wire nails	$2.50 to 2.55
Galv'd nails, shorter than 1-in.	4.75 to 4.80
Galv'd nails, 1-in. and longer	4.50 to 4.55
Polished staples	2.95 to 3.00
Galvanized staples	3.20 to 3.25

Coated nails, 100 lb. kegs, subject to Sept. 1, 1926, extra card over wire nail base.

Woven wire fencing (retailers) 12½ gage, 26-in. high 7-in. bars and 12-in. stays, per 100 rods, f.o.b. Pitts.	$20.03

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Cleveland-Pittsburgh base on products made there; Duluth $2 higher, Worcester, Mass., and Fairfield, Ala., $3 higher.

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-h'th rails, mill	43.00
Relaying rails, St. Louis	24.00 to 31.00
Relay, rails, Pitts., 60 to 70 lb.	25.00 to 27.00
Light rails, 25 to 45, mills	36.00
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.80c
Spikes, small railroad, 7-16-inch and smaller, Pitts.	2.80c
Spikes, boat and barge, Pitts.	3.10c
Spikes, railroad, Chicago	2.90c
Track bolts, Pitts. stand.	70 off list
Track bolts, Chicago	3.90c
Tie plates, Chicago, Pitts.	2.35c

Iron and Steel Pipe

Base Discounts Pittsburgh and Lorain, O. to Jobbers in Carloads

	Black	Galv.
1 to 3-inch butt steel	62	50½
1 to 1½-inch, butt iron	30	13

Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del. 2½ points less.

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional—F.o.b. Pittsburgh Mills

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled 3¼ to 3½-inch	46 off

Further discounts of seven 5 per cents for carloads or six 5 per cents for less-carload, on lap welded steel. On seamless hot rolled several more 5 per cents, and on charcoal two 10 per cents to two 10 and one 5 per cents.

Cast Iron Water Pipe

Prices per net ton

Class B Pipe

Four-inch, Birmingham	$38.00 to 39.00
Six-inch and over, Birming'm	34.00 to 35.00
Four-inch, Chicago	46.20 to 47.20
Six-inch to 24-inch, Chicago	42.20 to 43.20
Over 24-inch, Chicago	45.20
Four-inch, New York	51.50
Six-inch and over, New York	47.50
Standard fittings, Bir. base	$110.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $4 higher than Class B

Bolts and Nuts

F.o.b. basing points, Pittsburgh, Cleveland, Birmingham and Chicago.

Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lots, apply to lists of April 1, 1927.

CARRIAGE BOLTS

All sizes, cut thread	70 off

Rolled thread ⅝x6 and smaller take 10 per cent lower list.

Eagle list	65-10 off

MACHINE BOLTS

All sizes, cut thread	70 off

Rolled thread ⅝x6 and smaller take 10 per cent lower list.

Lag screws	70 off
Plow bolts, Nos. 1-2-3-7 heads	70 off
Tap bolts	70 off
Blank bolts	70 off
Stud bolts without nuts	70 off
Stove bolts, 80-10-5 off in packages; 80-10-5 with 2½ off in bulk.	
Tire bolts	60-5 off

NUTS

Semifinished	70 off

HEXAGON CAP SCREWS

Milled	80-10-10 off
Upset 1-in. diam and smaller	85-5 off

SQUARE HEAD SET SCREWS

Milled	80-10 off
Upset, 1-in. diam. and smaller	80-10-10 off

Rivets

Structural rivets, carloads, Pittsburgh and Cleveland	2.75c to 3.00c
Structural rivets, c. l., Chi.	2.85c

**Rivets, 7/16-inch and smaller, Pittsburgh, Cleveland and Chicago, 70, 10 and 5 to 70 and 10 off.

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Washers

Wrought c.l., Chicago dist.	$6.75 to 6.90 off
Wrought c.l., Pitts. dist.	6.75 off
Lock washers (dealers')	85-5 off

Pig Iron

Valley Malleable and Steelmaking Grades Down 50 Cents—Buffalo and Southern Ohio Lower—Light Demand

SLOW demand for pig iron for third quarter has resulted in lower quotations this week in the valley district, southern Ohio and Buffalo; following recent reductions at Cleveland, St. Louis and eastern Pennsylvania. That the market has not entirely adjusted itself is indicated by the fact valley furnaces still hold to $18, base, for foundry grades, while malleable has been marked down 25 cents, and basic and bessemer and other grades have been reduced 50 cents. A report of $17 done recently on a round tonnage of basic in northern Ohio is believed to refer to a special arrangement between buyer and seller; while $17.50, valley, applied on open market sales. General demand is light; not more than 30,000 tons has been sold at Chicago for third quarter.

PITTSBURGH, June 28.—The pig iron market is slightly more active. Steelmaking grades are lower by 50 cents. A report of a sale of a round tonnage of basic iron in northern Ohio at $17, furnace, is unconfirmed here. A Pennsylvania steelworks interest closed at $17.50, valley, against a recent price of $18. One valley merchant furnace has adopted the same figure and another is ready to do so. Bessemer iron also is down 50 cents. One builder of rolling mill machinery bought 2000 tons of bessemer at $18.50, Pennsylvania furnace, having the same freight rate here as from the valley. A valley merchant stack booked orders at the same figure. Another which has been selling in small lots up to 150 tons at a time at $19, valley, now is about to quote $18.50. Low phosphorus iron also has declined. Several 100-ton lots were sold to one buyer at $27.50, valley, although $28 still is quoted on carload lots. An eastern furnace is continuing its price of $25, furnace, having a freight rate of $4.66. One buyer of malleable recently received a quotation of $17.75, valley, although other producers are adhering to $18, valley, minimum. Figures below $18, valley, on No. 2 foundry iron are disappearing. The latter price with 50-cent silicon differential applied on sales amounting to 2500 tons of three grades purchased by a local builder of rolling mill machinery. This included 1000 tons of No. 2 at $18, Pennsylvania steelworks furnace having the same freight rate as valley stacks; 1000 tons of No. 3 at $17.50 and 500 tons of No. 2 at $18.50. A local car builder bought a round tonnage of car wheel malleable at $18, Pennsylvania furnace. Several other small sales of foundry iron are noted at $18, base.

Boston, June 28.—Business in this district is quiet, with no change in foundry operations. There is more interest in pig iron purchases, and it looks as though July would develop some good sales. Inquiry for third quarter is not so brisk now as had been expected, but outlook for last quarter is brightening. A local furnace reports sales in the past week of approximately 1000 tons. Price at Everett, Mass., furnace is $19 to $21, with freight the governing factor. Buffalo price is $17.50, base.

New York, June 28.—Richardson & Boynton Co., Dover, N. J., has closed for 3000 tons of foundry iron for third quarter and Lidgerwood Mfg. Co., Newark, N. J., has closed for 600 tons for remainder of this year. These are the principal purchases here. New inquiry is small. It is understood that on some of the business mentioned as low as $17, base, Buffalo was done. The market in general, continues $17.50 to $18, base, Buffalo, and $20.50 to $21, base, eastern Pennsylvania furnace. On Dutch foundry iron the market is slightly off and this iron now is $22, duty paid, tidewater. Indian foundry iron is quoted at $21.75, duty paid, tidewater.

Pig Iron Prices

Per gross ton

Bessemer, valley furnace	$18.50
Bessemer, del. Pittsburgh	20.26
Basic, valley furnace	17.50
Basic, del., Pittsburgh	19.26
Basic, Buffalo furnace	17.00 to 17.25
Basic, del., eastern Pa.	20.76 to 21.00
Malleable, valley furnace	17.75 to 18.00
Malleable, del., Pittsburgh	19.51 to 19.76
Malleable, del., Cleveland	19.00
Malleable, Chicago furnace	20.00
Malleable, Buffalo furnace	17.00 to 17.50
Malleable, del., eastern Pa.	21.75 to 22.25
No. IX, Eastern del., Phila.	22.26 to 23.26
No. IX, Buffalo furnace	18.00 to 18.50
No. 1 foundry, Chicago furnace	20.50
No. 2 foundry, valley furnace	17.75 to 18.00
No. 2 foundry, del. Pittsburgh	19.51 to 19.76
No. 2 fdy., Everett, Mass., fur.	19.50 to 20.50
No. 2 foundry, Buffalo furnace	17.00 to 17.50
No. 2 foundry, Chicago furnace	20.00
No. 2 foundry, Granite City	20.00 to 20.50
No. 2 foundry, Ironton furnace	19.00 to 19.50
No. 2 foundry, del., Cleveland	19.00
No. 2 foundry, del., Phila.	21.26 to 22.26
No. 2 foundry, N. J., tidewater	20.78 to 22.76
No. 2X east, N. J., tidewater	21.28 to 23.26
No. 2X, eastern del., Phila.	21.76 to 22.76
No. 2X, foundry, Buffalo furnace	17.50 to 18.00
No. 2X, eastern del., Boston	23.15 to 24.15
No. 2X, Buffalo, del., Boston	21.91 to 22.91
No. 2 Alabama, Birmingham	18.00
No. 2 Alabama, del. Cincinnati	21.69
No. 2 Tenn., Birmingham base	18.00
No. 2 Tenn., del. Cincinnati	21.69
No. 2 Alabama, del. Philadelphia	24.01
No. 2 Alabama, del. Chicago	24.01
No. 2 Ala., del Chicago river-rail	22.18
No. 2 Ala., del., Boston, rail-water	24.91 to 25.91
No. 2 Alabama, del. Cleveland	24.01
No. 2 Alabama, del. St. Louis	22.42
No. 2X, Virginia furnace	22.00
No. 2X, Virginia, del. Phila.	27.17
No. 2X, Virginia, del., Jers. City	27.54
No. 2X, Virginia, del. Boston	27.92
Gray forge, delivered eastern Pa.	20.75 to 21.00
Gray forge, val., del., Pittsburgh	19.01 to 19.26
Low phos., standard, valley	27.50
Low phos., standard, Phila	25.76 to 29.79
Low phos., copper bearing fur.	24.00
Charcoal, Birmingham	29.00
Charcoal, Superior, del. Chicago	27.04

Silvery iron Jackson county, Ohio furnace, 5 per cent $25.50; 6 per cent $26.50; 7 per cent $27.50; 8 per cent $28.50; 9 per cent $30.00; 10 per cent $32.00; 11 per cent $34.00; 12 per cent $36.00; 13 per cent $38.00; and 14 per cent $40.00.

Bessemer ferrosilicon, Jackson county, Ohio, furnace, 10 per cent $34.00; 11 per cent $36.00; 12 per cent $38.00; 13 per cent $40.00; and 14 per cent $42.00; 15 per cent $44.50; 16 per cent $47.00; 17 per cent $49.50.

Toronto, Ont., June 28.—Third quarter pig iron inquiries are fairly numerous and a number of good contracts have been closed. It is estimated about 60 per cent of those who place quarterly contracts are covered. Spot demand has again dropped off. Toronto prices are: No. 1 (2.25 to 2.75 silicon), $24.10; No. 2 (1.75 to 2.25 silicon), $24.10; malleable, $24.10. Montreal prices are: No. 1, $26.50; No. 2, $26.50; malleable, $26.50; basic, $25.50.

Cleveland, June 28.—The pig iron market has lapsed into a quiet period following recent activity. Sales booked by furnace interests with headquarters here totaled 20,000 tons during the past week, one-third the volume reported in the week preceding. The buying movement for July and third quarter has been conservative. The largest tonnage of foundry iron in the past week, 2500 tons, was placed by an eastern consumer. Some furnace interests report their current operations are on a satisfactory basis due largely to shipments on past-due orders. Shipments generally are well maintained; a leading merchant furnace interest shipped considerably more iron than it made in June. Stocks at melters' yards are low and buying is of small-lot, hand-to-mouth character. Some furnaces note an improvement in demand from automotive sources. Local makers are adhering to $18.50, base, furnace, for shipment in Cleveland, and generally

(*Concluded on Page* 1691)

Buffalo, June 28.—Buffalo furnaces have reduced their base price on foundry and malleable iron to $17.50. One maker holds to $18. It is believed the largest tonnage taken here last week, about 1500 tons, went at a price close to $17. At least 7500 tons of iron was sold at the lower prices during the week. The Wickwire-Spencer Steel Co.'s furnace will go into blast about July 9, it is announced.

Coke

Price Differences Emerge from Wage Inequalities—By-Product Fuel Underselling Beehive

SOME of the smaller Connellsville beehive coke producers which have reduced wages recently are offering spot furnace fuel at $2.85, while larger producers, unwilling to adopt a similar wage policy, are adhering to $3.25. The latter price seems to be the minimum for contracts. A valley furnace is reported to have purchased by-product fuel at a lower figure.

Pittsburgh, June 28.—Arrangements made recently for Connellsville beehive furnace coke for third quarter carry a price of $3.25. Blast furnaces apparently have decided against paying more. Since several stacks placed orders as noted last week one valley furnace is understood to have purchased by-product fuel at a figure equivalent to less than $3.25, Connellsville. One other interest now is negotiating. Several inquiries have been issued by nonmetallurgical users for 1000 tons of coke at a time. These likewise have been quoted $3.25. However, some have been able to pick up cheaper coke, since several small operators evidently on a reduced wage basis are offering spot coke at $2.85 to $3 in lots up to 3000 tons. Other producers on a higher wage scale are maintaining $3.25 as a minimum, even on small lots of furnace coke, reiterating their disinclination to reduce wages at this time. Selling of foundry coke is limited, contracting being practically finished for the last half. Premium brands are quoted at $5.35 in open top cars and $5.60 in box cars. Regular standard brands are $4.50 to $4.75. The spot market minimum is $4.

Production of coke in the Connellsville region in the week ended June 18 was 92,650 tons, compared with 96,900 tons in the preceding week, according to the *Connellsville Courier*.

Boston, June 28.—Local demand for coke is good. Prices remain unchanged at $12, delivered, and no change from this level is expected in the near future. Oven production and foundry demand remain unchanged.

New York, June 28.—Little business is noted in the coke market. Spot beehive foundry coke is quoted at $4 to $4.50, Connellsville, for ordinary brands. By-product foundry coke continues to be quoted at $9.59 to $10.77, delivered at Newark and other northern New Jersey consuming points, according to the freight.

Detroit, June 28.—Demand for foundry coke shows little change. Current requirements are comparatively small. General activities are expected to show improvement during July and increased demand for coke is looked for. The price remains $9.50, ovens.

Cincinnati, June 28.—Foundry coke shipments for June show an increase over May. Automobile foundry specifications were satisfactory in June, with a slight slowing down in the past week. There is little likelihood of change in prices of any brand in July, dealers say.

St. Louis, June 28.—The movement of metallurgical coke is seasonally dull. Foundries are well supplied, and are not adding to their commitments. The melt of pig iron has declined further, and no change in the present status of the coke market is anticipated during the next few weeks. Production at by-product plants is holding at recent levels, and prices generally are steady.

Birmingham, Ala., June 28.—Independent coke manufacturers are finding fairly good demand for foundry fuel. Quotations for domestic coke are moving downward. Coal production in Alabama is 75,000 tons under normal for the week, with reduced coke making a contributing cause.

Coke Prices

Beehive Ovens

Prices per net ton

Connellsville furnace	$2.85 to 3.25
Connellsville foundry	4.00 to 4.75
New River foundry	7.00 to 8.00
New River furnace	6.00
Wise county furnace	4.25 to 5.00
Wise county foundry	4.00 to 5.00
Alabama foundry	6.00

By-Product

Foundry, Newark, N. J.; del.	9.59 to 10.77
Foundry, Chicago, ovens	9.75
Foundry, New England, del.	12.00
Foundry, St. Louis	9.75 to 10.00
Foundry, Birmingham	5.50
Foundry, Indianapolis, del.	10.25
Foundry, Ashland, Ky.	7.50
Foundry, Portsmouth, O.	7.50

Ferroalloys

Spiegeleisen Softer—Shipments of Ferroalloys Tapering Off

New York, June 28.—Lower prices have developed in spiegeleisen, sales now being noted at $34 to $35, furnace, for 19 to 21 per cent grade in single carlots. Lower may be done on larger lots. Contracts have been renewed. Shipments of spiegeleisen so far have not reflected any shrinkage, but in view of decreased steel production, some curtailment in spiegeleisen shipments is expected during the next few weeks.

The Imperial Steel Works of Japan is inquiring here for 200 tons of 75 per cent ferrosilicon, five tons of nickel shot and 10 tons of ferrochrome.

Pittsburgh, June 28.—Buyers of ferroalloys are cutting down still further on shipments. Specifications for ferromanganese have shrunk considerably in accordance with curtailed operations. A large rolling mill machinery interest has just closed on a tonnage of ferromanganese with a domestic maker. In spiegeleisen, the trade is well covered for last half.

Chicago, June 28.—Spiegeleisen can be obtained at $34 to $35, Hazard, Pa. Most of the users are covered well into August. Ferromanganese is exteremely quiet. At least one offer of ferromanganese at below $90, seaboard, is reported.

Value of the Budget

The budget in business, as a means through which management achieves co-ordinated effort, conservation of resources, and more rapid turnover of merchandise inventories, is described in a 32-page booklet, "Business Control through Analysis," just issued by Ernst & Ernst, accountants.

The booklet explains that in preparing the budget, an advance estimate of sales is made according to lines of merchandise and the months of the budget period. Buying allowances, production schedules, expense, collections, improvements, financing and profits are planned in the light of the sales estimate. The calculations, it is said, are based on analysis of past operating results, study of markets and trade conditions.

Any business in the retail, wholesale, manufacturing or any other field, the booklet points out, can be budgeted to some extent and to real advantage regardless of the seasons, weather, crops or other conditions.

Weigh Standard Forms

Chicago, June 28.—A referendum vote of the membership of the Concrete Reinforcing Steel institute is being taken to obtain approval of the standard contracts which have been proposed by the institute. One is for the leasing of forms and the other is for the leasing and erection of forms. The contracts were placed before the institute's board of directors, May 19.

Ferroalloy Prices

Ferromanganese, 78 to 82 per cent, tidewater, duty paid	$90.00
Ferromanganese, del., Pittsburgh	94.79
Spiegeleisen, 19 to 21 per cent domestic furnace	34.00 to 35.00
Ferrosilicon, 50 per cent freight allowed	85.00 to 87.50
Ferrochrome, 60-70 chromium, 4-6 carbon, cts. per lb. con., del.	11.50
Ferrotungsten stand. lb. cont.	0.98 to 1.00
Ferrovanadium, 30-40 per cent, per lb. estimated on analysis	3.15 to 3.65
Ferro-carbon-titanium carload, producers plant, net ton	200.00
Ferrophosphorus, per ton, carload, 17 to 19 per cent, Rockdale, Tenn., basis (18%)	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23-25% f.o.b. Anniston, Ala., (24 per cent)	122.50

Plates

Orders Limited to Small Miscellaneous Lots—Oil Tank Inquiries Better—Prices Firmer

PLATE demand continues of a miscellaneous, small-lot character. Some additional inquiries for oil storage tanks developed at Chicago and Pittsburgh, requiring more than 8000 tons of plates. Purchases for this purpose at Chicago totaled 1200 tons during the past week. While 1.80c, Pittsburgh, continues to reflect the market, a slightly firmer tendency is noted.

PLATE PRICES, PAGE 1676

Pittsburgh, June 28.—While several plate fabricating shops are busy on jobs they booked recently, such as barge work, other shops working primarily for the tank trade are in need of business. A few 80,000-barrel oil tanks are up for closing this week at Baltimore, and some additional oil tanks are wanted for Texas. Plates are 1.80c and 1.85c, any levels below that minimum being confined to the East. So far the plate mills have not accepted many contracts for third quarter, each shipper having unspecified tonnage on his books which is quietly being carried over. A 1600-ton riveted pipe line at Akron, O., is to be awarded this week.

Boston, June 28.—Lull in the building market still holds plate business in check, but there has been a fair tonnage in small lots during the past week. Price remains 1.80c, Pittsburgh.

New York, June 28.—The plate market here now may be quoted at 1.80c to 1.85c, base, Pittsburgh, equivalent to 2.12c to 2.17c, delivered, New York. Lower prices are exceptional. Operations at eastern mills have shown no shrinkage. Several eastern railroads are in the market for third quarter, including New York Central, Pennsylvania, Lehigh Valley and Erie.

Cleveland, June 28.—Third quarter contracts are being closed on the basis of 1.80c, Pittsburgh. Most makers believe the price weakness is no more than can be expected in midsummer and that the market will remain 1.80c through the quarter. Some lake vessel tonnage still is pending.

Detroit, June 28.—Automotive consumption of light plates in July promises to measure up with June, but demand for heavy plates is in a slump. The market on attractive business tends toward 1.80c, Pittsburgh, with 1.85c done on small lots.

Chicago, June 28.—Mills in the Chicago district booked 1200 to 1500 tons of tank plates for oil storage work in Oklahoma fields during the week. New inquiry which has developed brings the total prospective tonnage to 5000 to 8000 tons. Plates are quoted at 1.90c to 2.00c, Chicago.

Philadelphia, June 28.—Plate demand is fully maintained. June bookings are equal to May or better. Usual prices are 1.80c to 1.85c, with 1.75c somewhat more frequent on attractive tonnages.

CONTRACTS PENDING

New Inquiry and Developments on Projects Previously Reported

210 tons, 18-inch pipe line for Santa Maria, Calif.; bids in July 10. Alternate bids on July bids on Matheson joint pipe or equal.

100 tons, standpipe for Clackamas, Oreg.; bids in July 6.

Smith & Watson Iron Works, Portland, Ore., has changed its name to Smith & Valley Iron Works Co. and has increased capital from $100,000 to $500,000.

Unite Forging Machinery Sales Organizations

Chambersburg, Pa., June 28.—Sales forces of the Chambersburg Engineering Co., Chambersburg, Pa., and the National Machinery Co., Tiffin, O., will be united effective July 1. The Chambersburg-National sales organization will handle complete equipment for forging and pressing operations and will offer engineering counsel on such problems. The hammers and hydraulic machinery of the Chambersburg company and the bolt and forging equipment of the National organization will be distributed through the individual headquarters in Chambersburg and Tiffin, and also through the combined branch offices in Detroit, Donovan building; Chicago, Sharpels building, and New York, Knickerbocker building.

Red hematite ore of Red Mountain first was used in a blast furnace, known as the McIlwain stack south of Irondale in Shades Valley, Ala.

Semifinished

Strip Steel Makers Close for Billets—Prices Steady—Forging Billets Down $1

BILLETS are in more active demand, several good contracts having been closed during the past week. These mainly are for July and August shipment. The only concessions noted on billets, slabs and sheet bars are that sometimes the mills absorb freight. Forging billets have declined $1, contracts for third quarter now being closed at $39, Pittsburgh.

SEMIFINISHED STEEL PRICES, PAGE 1677

Pittsburgh, June 28.—Some users of semifinished steel among strip steel manufacturers supplying their wants here have been active in purchasing for July and August. One large Pennsylvania steel interest reports closing a billet contract for the July-August tonnage requirements of a strip steel maker here, and expects to close another early this week. Billets and slabs are $33. Sheet bars are quoted at $33.50 and $34; sometimes these are delivered prices instead of f.o.b. mill. Forging billets have declined $1 and contracts for third quarter are being accepted at $39. Tonnages represent a fairly good aggregate. Some wire rod sellers have reestablished the $43 price, one or two never having departed officially from that level. The $42 price has not entirely disappeared. Some wheel skelp in lots of three or four carloads at a time is sold at 1.90c, but pipe skelp contracts carry 1.80c.

Youngstown O., June 28.—While some strip steelmakers are taking some small additional tonnages of billets, and the local sheet mills are accepting shipments of sheet bars, the semifinished steel market is not active. The third quarter price is likely to open next Friday at today's levels of $33 for billets and slabs and $34 for sheet bars, Youngstown bases.

Chicago, June 28.—Semifinished material is quiet, with no tendency toward third quarter contracting. The price of small billets is nominal at $35, base, Chicago. Wire rods are quoted at $42 to $43.

Philadelphia, June 28.—The billet market here is $33 to $34, Pittsburgh, for rerollers and $39 for forging quality. Some business was placed here at these figures in the past week.

Cut Manganese Ore Price

New York, June 28.—Brazilian manganese ore is held at lower prices. It has been offered in moderate size tonnages at around 35 to 36 cents per unit, c.i.f. tidewater. Indian manganese ore continues to be held at 37 to 38 cents. Caucasian manganese ore is unchanged at 40 cents per unit for the washed grade.

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross Tons Delivered to Consumers

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	10.50 to 11.00
Boston (dealers)	9.00 to 9.50
Buffalo, No. 1	14.75 to 15.25
Buffalo, No. 2	14.00 to 14.50
Chicago	12.00 to 12.50
Cincinnati (dealers)	11.50 to 12.00
Cleveland, No. 1	13.50 to 14.00
Cleveland, No. 2	13.00 to 13.50
Detroit, No. 1	11.50 to 12.00
Eastern Pennsylvania	14.00 to 14.50
Bethlehem delivery	14.00 to 14.50
New York (dealers) (railroad)	10.00 to 11.35
New York (dealers) (yard)	6.75 to 7.25
Pittsburgh, No. 1	14.75 to 15.25
St. Louis	10.75 to 11.25
Valleys, No. 1	15.50

COMPRESSED SHEETS

Buffalo	12.50 to 13.00
Chicago	10.25 to 10.75
Cleveland	13.00 to 13.25
Detroit	10.50 to 11.00
Pittsburgh	13.75 to 14.25
Valleys	14.00 to 14.50

BUNDLED SHEETS

Buffalo	10.00 to 10.50
Cincinnati (dealers)	9.50 to 10.00
Cleveland	11.00 to 12.00
Eastern Pennsylvania	10.00
Pittsburgh	12.75 to 13.25
St. Louis	8.50 to 9.00

SHEET CLIPPINGS, LOOSE

Chicago	8.25 to 8.75
Cincinnati	8.75 to 9.25
Detroit	7.50 to 8.00
St. Louis	8.00 to 8.50

STEEL RAILS, SHORT

Birmingham	12.50 to 13.00
Buffalo	14.00 to 15.00
Chicago	15.50 to 16.00
Cincinnati (dealers)	17.00 to 17.50
Detroit	11.50 to 12.00
St. Louis	15.00 to 15.50

STOVE PLATE

Birmingham	13.00 to 14.00
Boston (consumers)	11.50 to 12.00
Buffalo	13.25 to 13.75
Chicago (net)	12.25 to 12.75
Cincinnati (dealers) (net)	9.00 to 9.50
Cleveland	12.00 to 12.50
Detroit (net tons)	10.50 to 11.00
Eastern Pennsylvania	11.50 to 12.00
New York (dealers) (mill)	8.00
Pittsburgh	12.00 to 12.50
St. Louis	14.00 to 14.50

LOW PHOSPHORUS

Buffalo, billet and bloom crops	16.00 to 16.50
Cincinnati (dealers)	14.00 to 14.50
Eastern Pennsylvania	18.00 to 18.50
Pitts. billet and bloom crops	19.00 to 19.50
Cleveland, billet and bloom crops	17.00 to 17.50

SHOVELING STEEL

Chicago	12.00 to 12.50
Pittsburgh	10.50 to 11.00
St. Louis	10.75 to 11.25

KNUCKLES, COUPLERS, SPRINGS

Chicago	14.00 to 14.50
Eastern Pennsylvania	16.00 to 16.50
Pittsburgh	16.00 to 16.50
St. Louis	12.00 to 12.50

FROGS, SWITCHES, GUARDS

Chicago	13.00 to 13.50
St. Louis	12.50 to 13.00

ANGLE BARS—STEEL

Buffalo	15.25 to 15.75
Chicago	13.00 to 13.50
St. Louis	11.75 to 12.25

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	11.00 to 11.50
Boston (dealers)	10.50 to 11.00
Buffalo, No. 1	13.00 to 13.50
Buffalo, No. 2	14.25 to 14.75
Chicago, No. 1	12.00 to 12.60
Chicago, No. 2	12.00 to 12.50
Cincinnati, No. 1 (dealers)	11.50 to 12.00
Cleveland, No. 1	11.50 to 12.00
Eastern Pennsylvania	16.50 to 17.00
New York, No. 1 (dealers)	14.00 to 14.50
Pittsburgh, No. 1	12.00 to 12.50
Pittsburgh No. 2	14.75 to 15.25
St. Louis, No. 1	11.00 to 11.50
St. Louis, No. 2	10.75 to 11.25

WROUGHT PIPE

Boston (dealers)	8.00 to 8.50
Eastern Pennsylvania	12.50 to 13.00
Buffalo	13.00 to 13.50
New York (dealers)	8.75

YARD WROUGHT

Boston	8.50 to 9.00
Eastern Pennsylvania	16.00 to 16.50

BUSHELING

Buffalo	12.75 to 13.25
Chicago, No. 1	10.50 to 11.00
Chicago, No. 2	9.00 to 9.50
Cincinnati, No. 1 (dealers)	10.50 to 11.00
Cincinnati, No. 2	8.00 to 8.25
Pittsburgh, No. 1	12.75 to 13.25
St. Louis, No. 1	9.75 to 10.25

MACHINE SHOP TURNINGS

Birmingham	8.50 to 9.00
Boston	5.00 to 5.50
Buffalo	9.50 to 10.00
Chicago	7.00 to 7.50
Cincinnati (dealers)	7.50 to 8.00
Cleveland	8.75 to 9.00
Detroit	7.25 to 7.75
Eastern Pennsylvania	10.00
New York (dealers)	6.00 to 7.35
Pittsburgh	10.50 to 11.00
St. Louis	6.75 to 7.25

CAST IRON BORINGS

Birmingham (chemical)	13.00 to 13.50
Birmingham (plain)	8.50 to 9.00
Boston, chemical	10.50 to 11.00
Boston (dealers)	6.50 to 7.00
Buffalo	10.00 to 10.50
Chicago	9.75 to 10.00
Cincinnati (dealers)	8.50 to 9.00
Cleveland	10.00 to 10.50
Detroit	8.00 to 8.50
Eastern Pennsylvania	11.00 to 11.50
Eastern Pennsylvania (chem.)	15.50 to 16.00
New York (dealers)	6.85 to 7.35
Pittsburgh	10.50 to 11.00
St. Louis	8.75 to 9.25
Valleys	13.50

MIXED BORINGS AND TURNINGS

For blast furnace use

Boston (dealers)	5.50 to 6.00
Buffalo	10.00 to 10.50
Cincinnati (dealers)	8.50 to 9.00
Cleveland	10.00 to 10.50
Detroit	8.00 to 8.50
Eastern Pennsylvania	10.50
New York (dealers)	6.85 to 7.35
Pittsburgh	10.50 to 11.00

PIPES AND FLUES

Chicago (net)	7.50 to 8.00
Cincinnati (dealers)	8.00 to 8.50
St. Louis	8.50 to 9.00

RAILROAD GRATE BARS

Buffalo	11.00 to 11.50
Chicago (net)	11.25 to 11.75
Cleveland	12.00 to 12.50
Eastern Pennsylvania	11.50 to 12.00
New York (dealers)	8.50 to 9.00
St. Louis	11.50 to 12.00

FORGE FLASHINGS

Boston (dealers)	7.00 to 7.50
Buffalo	12.50 to 13.00
Chicago	9.00 to 9.50
Cleveland (over 10 in.)	12.50 to 13.00
Detroit	9.50 to 10.00
Pittsburgh	13.00 to 13.50

FORGE SCRAP

Boston (dealers)	6.00 to 6.50
Chicago	14.25 to 14.75
Eastern Pennsylvania	10.50 to 11.00

ARCH BARS AND TRANSOMS

Chicago (net)	18.50 to 19.00
St. Louis	18.75 to 19.25

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	8.00 to 8.50
Buffalo	12.75 to 13.25
Chicago	10.00 to 10.50
Cleveland	12.00 to 12.50
Eastern Pennsylvania	12.50 to 13.00
Pittsburgh	13.00 to 13.50
St. Louis	9.00 to 9.50

STEEL CAR AXLES

Birmingham	16.00 to 17.00
Boston (shipping point)	16.00 to 16.50
Buffalo	16.50 to 17.00
Chicago	19.60 to 20.15
Cleveland	16.00 to 16.50
Eastern Pennsylvania	20.00
Pittsburgh	19.00 to 19.50
St. Louis	18.75 to 19.25

SHAFTING

Boston (shipping point)	13.50 to 14.00
Chicago	17.35 to 18.00
Eastern Pennsylvania	18.00 to 20.00
New York (dealers)	14.00 to 14.50
St. Louis	17.50 to 18.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	12.00 to 13.00
Boston (consumers)	17.00 to 17.50
Buffalo, iron	13.50 to 14.00
Buffalo, steel	16.50 to 17.00
Chicago, iron	13.50 to 14.00
Chicago, steel	14.25 to 14.75
Cincinnati	13.00 to 13.50
Eastern Pennsylvania	16.00 to 16.50
New York iron (dealers)	12.50 to 13.50
Pittsburgh, iron	15.00 to 15.50
Pittsburgh, steel	16.00 to 16.50
St. Louis, iron	13.00 to 13.50
St. Louis, steel	13.25 to 13.75

No. 1 CAST SCRAP

Birmingham, cupola	14.00 to 15.00
Boston	15.50 to 16.00
Buffalo	15.50 to 16.00
Chicago, No. 1 machinery	16.50 to 17.00
Chicago, No. 1 railroad	15.10 to 15.65
Chicago, No. 1 agricultural	14.85 to 15.40
Cincinnati No. 1 machinery cupola (net tons dealers)	15.50 to 16.00
Cleveland, cupola	15.75 to 16.25
Detroit (net tons)	14.00 to 14.50
Eastern Pennsylvania, cupola	16.50 to 17.00
New York, cupola (dealers)	13.50 to 14.00
Pittsburgh, cupola	15.00 to 15.50
San Francisco, delivered	20.00 to 21.00
Seattle	16.00
St. Louis, railroad	15.00 to 15.50
St. Louis, agricultural	15.00 to 15.50
St. Louis, machinery	17.00 to 17.50
Valleys	16.50 to 17.00

HEAVY CAST

Boston	14.50 to 15.00
Buffalo (breakable)	13.00 to 13.50
Cleveland	12.50 to 12.75
Detroit (automobile) (net tons)	17.50 to 18.50
Eastern Pennsylvania	15.50 to 16.00
New York (dealers)	12.50 to 13.00
Pittsburgh	14.00

MALLEABLE

Boston, railroad	14.50 to 15.00
Buffalo	16.00 to 16.50
Chicago, agricultural	13.00 to 13.50
Chicago, railroad	13.50 to 14.00
Cincinnati, railroad (dealers)	14.00 to 14.50
Cincinnati, agricultural (dealers)	13.00 to 13.50
Cleveland, agricultural	15.00 to 15.50
Cleveland, railroad	15.50 to 16.00
Detroit, auto	15.00 to 15.50
Pittsburgh, railroad	14.50 to 15.00
St. Louis, agricultural	12.50 to 13.00
St. Louis, railroad	12.00 to 12.50

Miscellaneous Scrap

RAILS FOR ROLLING

5 feet and over

Birmingham	13.00 to 14.00
Boston (dealers)	10.50 to 11.00
Buffalo	15.00 to 15.50
Chicago	14.50 to 15.00
Eastern Pennsylvania	16.50 to 17.00
New York	12.00 to 12.50
Pittsburgh district	16.00 to 17.00
St. Louis	13.50 to 14.00

LOCOMOTIVE TIRES

Chicago, No. 1	15.50 to 16.00
Chicago, cut	14.50 to 15.00
St. Louis, No. 1	14.00 to 14.50

LOW PHOSPHORUS PUNCHINGS

Chicago, cut	14.00 to 14.50
Pittsburgh	17.00 to 17.50

Scrap

Demand Lifeless with Prices Shifting Slightly—No Definite Tendency Is Shown

SOME firmness is shown in iron and steel scrap in isolated instances. In other cases quotations still are descending. No general movement is discernible and the market in general continues listless. Prices on most grades have reached a lower level. A tendency is developing for dealers to accumulate stocks, an indication of the market scraping bottom.

Chicago, June 28.—Iron and steel scrap shows a slightly firmer tendency, largely due to the fact scrap is coming out less freely. Dealers are not inspired to prepare scrap for shipment in the present market. Possibility is seen of dealers laying down stocks to a moderate extent if present low prices continue. Axle turnings are off 50 cents to $10 to $10.50. Plate scrap is weaker also and is quoted 50 cents under recent prices. The range for low phos plate under 12 inches is $14 to $14.50; this price also applies to low phos punchings.

New York, June 28.—Scrap prices are featured by a reduction in No. 1 yard steel and No. 1 railroad, dealers now paying $6.75 to $7.25, and $10 to $11.35, New York, respectively. The reduction in yard steel follows a revision in prices at Pottsville, Pa., and Harrisburg, Pa., with dealers paying $10.50, delivered, for both points. Yard steel has been reduced as a result of buying by the Worth Steel Co., Claymont, Del., dealers paying $13.50, delivered. Other grades are unchanged, but with supplies fairly plentiful when lower mill operations are considered.

Buffalo, June 28.—Scrap continues lifeless and further price recessions are noted. There is no major demand for heavy melting steel and such tonnage as is moving is going largely into dealers' yards. Stove plate has broken to prices averaging $13.50.

Pittsburgh, June 28.—The only scrap activity worthy of note since a nearby purchaser of heavy melting steel paid $14.25, is the recent purchase by a mill located on the Ohio river of a tonnage of heavy melting steel scrap at $15.25. Some compressed sheets were included at $14.25, and some bundled sheets and No. 1 busheling at $13.25. Since this tonnage was closed by a few local sellers, the scrap market has been devoid of activity.

Cincinnati, June 28.—The only incident of note in the scrap market this week is the matter of railroad offerings. The Big Four offers 5600 tons. The Nickel Plate 10 cars and the Baltimore & Ohio, 29,000 tons. Demand for scrap is weaker and while some specifications are moving volume of delivery is shrinking.

St. Louis, June 28.—Iron and steel scrap reflects a slightly better feeling. There has been no rise in prices, but present levels seem firmly established, and it is somewhat more difficult to obtain offerings in the volume desired. Dealers are less disposed to sell, and there is no disposition to go short. There are fairly steady sales of small, scattered tonnages, the aggregate of which makes a fair showing. Several melters are willing to purchase round tonnages, but are unwilling to pay prices at which dealers are ready to sell.

Birmingham, Ala., June 28.—Little old material is being bought and consumers claim to be able to get the product almost at their own prices.

Cleveland, June 28.—Prices are steady on all grades of iron and steel scrap in which any movement can be detected. No buying is being done and shipments on contracts are being regulated closely. One blast furnace plant here has held up shipments the past week.

Boston, June 28.—Iron and steel scrap is dull. No new buying has developed and none is in sight. Prices have eased off on several grades.

Detroit, June 28.—Demand for iron and steel scrap continues to lag. Many of the larger consumers are out of the market and new business is confined to small orders. Dealers are buying only to cover immediate shipments.

Philadelphia, June 28.—A stronger tone is shown in iron and steel scrap and several instances have been met where recent prices will not bring out tonnage. Dealers find difficulty in buying heavy steel at $13.50 against $14 contracts and bundled sheets and turnings at $10. Forge scrap has sold somewhat lower.

Sheets

Market More Active, with New Orders Booked at Full Prices—Operations Better

STRONGER conditions prevail in the sheet market. Many mills have shipped out the material due consumers on contracts taken at the lower prices. Demand for third quarter is more active and the new price levels are held firmly. Better operations also are reported. Buying for automotive consumption is not expected to get into its stride until July.

SHEET PRICES, PAGE 1676

Pittsburgh, June 28.—Sheet orders are increasing in some instances equaling 80 per cent of the best year's business on record. All this business is carrying the new price, including individual orders for 1500 tons. Some attractive lots of black sheets recently were placed by metal sash manufacturers, and 3.00c, base, was paid. Some manufacturers of portable bolted oil tanks have been ordering blue annealed sheets heavily, and in each case the 2.25c figure prevailed. One buyer who claimed to have a 2.15c price has admitted his error and has bought his tonnage at 2.25c. Galvanized sheets are being sold every day at 3.85c, some improvement being noted in building construction. Incidentally, 1927 promises to outdistance 1926 in the manufacture of metal lath. Some material is ordered every few days for railroad car repairs, and some larger orders are expected as soon as contemplated car buying is completed. Buying of full finished sheets has slackened, but during July is scheduled to have a revival. While some of the buying for production of new models of motor cars in July and August has been completed, attractive tonnages will be placed soon. The full finished sheet price is firm at 4.25c. American Sheet & Tin Plate Co. is on a 75 per cent sheet operating basis, while some of the independents are as high as 80 per cent.

New York, June 28.—Sheet sellers report an unusually strong price situation. No business is being entered at less than 2.25c, base, Pittsburgh, for blue annealed, 3.00c for black and 3.85c for galvanized. One of the large consumers in this territory came in the market for a good size tonnage the past week but failed to obtain any concessions, and postponed purchase. Business has tapered off, as expected at this time of the year.

Detroit, June 28.—Autobody sheets appear to be firm at 4.25c, Pittsburgh. Some users have specified into early August. The few sales being made of galvanized and black carry the full 3.85c and 3.00c prices. The blue annealed situation causes some concern because of the competition of strip and light plate, but nothing to break through the recently established level of 2.25c has developed.

Shipments into this district in June have fallen somewhat behind May. Early July will be a light period. July consumption will measure up well with last July, and were Ford Motor

Co. operating would be even higher. A real upturn in automobile production is not looked for until September. Expected shifting of sources of sheet supply has not developed extensively within the automobile industry.

Chicago, June 28.—Sheet mill operations are continuing steadily at 85 per cent, on short-range orders. It is expected the leading independent will close all of its mills over July 4 for temporary repairs, but will resume at least partial operations early next week. Backlogs of about three weeks have accumulated on blue annealed sheets. Deliveries on black sheets can be made in a week to ten days, and on galvanized in two to three weeks. Mill prices for No. 24 black are 3.10c; for galvanized 3.95c and for No. 10 blue annealed 2.35c.

St. Louis, June 28.—Sheet demand has improved. Heavy tonnages of corrugated sheets are moving into the flood regions. Prices are firmly established at current levels. The Granite City steelworks of the National Enameling & Stamping Co. reports the third week of June was the best experienced this year in point of sales. This interest has placed in operation five of its mills which had been idle for some time. Operations are at 77 per cent of capacity, against 60 per cent a few weeks back.

Cincinnati, June 28.—Sheet buyers are beginning to enter the market for third quarter. Several large orders have been booked by local manufacturers at the new price levels. Books are open for third quarter, and inquiries are numerous.

Boston, June 28.—Prices for galvanized sheets hold at 3.85c, Pittsburgh. Sales in this territory have been fairly good the past week.

Cleveland, June 28.—Placing of several third quarter contracts for black sheet tonnage marked another demonstration of firmness of the 3.00c, Pittsburgh, price. Barrel makers indicate willingness to pay the full market level. Not much third quarter contracting is being done in the local automotive parts trade. Some blue annealed was closed at 2.25c. Autobody is firm at 4.25c and galvanized at 3.85c. Blue annealed sheet makers have refused to meet plate competition in some instances on heavy gages where plate prices are $1 to $2 under sheets.

Youngstown, O., June 28.—A larger number of independent sheet mill units are operating this week than last, due to an accumulation of orders. The two independent plants, closed last week, resumed operating Monday morning, bringing the total units now active up to 106 out of the total 127 independent units in the district, against 96 active last week. More promising tonnages of common black galvanized and autobody sheets have been received by the mills, here all at full prices. The mills have worked off practically all low-priced tonnage, the new business being for delivery in the third quarter.. Automotive demand is likely to become more active in the latter part of July. Quotations are holding firmly to the schedule of 3.00c on black sheets, 3.85c on galvanized, 4.25c on autobody and 2.25c on blue annealed. Mill managers here say they find less keen competition among eastern and western mills than formerly was the case, the new schedule of prices being more widely observed.

Philadelphia, June 28.—Sheets reflect the firmest price situation known here in a long time. Even the largest consumers in this territory have failed to break the market. However, there are not many real tests as consumers generally specified as much tonnage as they could use on second quarter contracts. Most of them will buy as they need material during the third quarter. While some contracts have been placed, mills say they never before have entered a quarter with so few contracts. Current quotations continue 2.25c, Pittsburgh, for blue annealed; 3.00c for black and 3.85c for galvanized.

Anchor Consolidated Concrete Machinery Corp., Adrian, Mich. has changed its name to Consolidated Concrete Machinery Corp.

Tin Plate

Last Half Tonnage Expected To Be Lower Than First

TIN PLATE PRICES, PAGE 1676

Pittsburgh, June 28.—Some specifications on tin plate are in hand for September shipment to large canmakers. Other consumers are furnishing August specifications. Last half tonnage on the whole is expected to be considerably below the first half, but exact figures are not available as yet. Some domestic buyers of tin plate are increasing their orders slightly, and a few attractive export orders recently were placed. One small eastern producer of tin plate is offering to quote exceedingly low figures on domestic plate but in the main $5.50 is the general open market figure. American Sheet & Tin Plate Co. is operating at 77 per cent. Others are operating around 80 per cent of mill capacity as an average.

Pipe

Line Pipe Business Lacking and Merchant Buying Spotty—Cast Includes 4000-Ton Iquiry

LACKING line pipe tonnage and with spotty buying of merchant pipe, tubular mills find new business slow. Settlement of strike conditions on Long Island, N. Y., has increased demand there for merchant pipe. Cast iron pipe, hindered by slow municipal demand in some sections, was featured by the closing of 4000 tons for Detroit with two American makers.

PIPE PRICES, PAGE 1676 AND 1714

Pittsburgh, June 28.—Miscellaneous orders from pipe jobbers are plentiful in some directions but lacking in others. Many pipe jobbers take inventories July 1, and consequently have been cutting down as much as possible on tonnage. Others are not turning over their stocks as rapidly as expected and buy only to keep inventories well rounded. Prices are established firmly, all pipe mills apparently realizing that no tonnage is to be gained by cutting quotations. Backlogs of large-size gas line pipe are not being replaced as rapidly as they are being depleted. Oil line business is lacking but one or two lines are pending.

Boston, June 28.—Good volume of private buying is done in small lots and public buying is about normal for this season of the year in the cast iron pipe market. Prices are firm and unchanged.

New York, June 28.—Dullness continues to dominate the eastern cast pipe market, orders and inquiries being scattered. An easier tendency is noted in prices, although they are holding at substantially the levels of the past two weeks.

Business in merchant pipe here has improved greatly as a result of the termination of the plumbers' strike on Long Island. The men have gone back to work under an agreement with the employers to arbitrate the points at issue. Pipe again is being used in normal tonnages and jobbers are replenishing their stocks.

Chicago, June 28.—While numerous 30 to 40-ton orders for cast iron water pipe are coming in steadily, important municipal programs continue to be deferred by backward weather. The only important award during this week was 4000 tons of 4 to 12-inch centrifugal pipe for St. Clair Shores, Mich. Six to 24-inch pipe is quoted at $42.20 to $43.20, delivered, Chicago.

Birmingham, Ala., June 28.—Little new business is being received but production still is active and deliveries steady. Not much pipe is being carried on the yards. Present prices for pressure pipe are $34 to $35 for 6-inch and over sizes. Soil pipe and fittings continue slow.

CONTRACTS PLACED

4000 tons, 4 to 12-inch centrifugal pipe for St. Clair Shores, Mich.; 2000 tons to National Cast Iron Pipe Co., and 2000 tons to United States Cast Iron Pipe & Foundry Co.
599 tons, 6 to 16-inch class B, improvement to Fifty-fourth street, San Diego, Calif.
277 tons, 4 to 8-inch class 150, Williams, Calif., to O. F. Fisher.

216 tons, 12-inch class B, Silverton Oreg., to Oswego Iron & Steel Co.

CONTRACTS PENDING

New Inquiry and Developments on Projects Previously Reported

1658 tons, 4 to 12-inch class C, Clackamas, Oreg.; bids in July 6.

630 tons, 6 and 12-inch pipe, Yonkers, N. Y.; Donaldson Iron Works low bidder.

506 tons, 6 to 10-inch class B, improvement to Valencia park unit No. 2, San Diego, Calif.

215 tons, 4 and 6-inch class B, Ravenswood water district, Redwood City, Calif.; bids in July 11.

Autos Take Less Copper, More Zinc, Tin, Lead

New York, June 28.—The automobile industry in 1926 consumed 102,800 tons of copper, according to the American Bureau of Metal Statistics. This was a decline compared with 106,400 tons used in 1925. At the same time the industry used 21,300 tons of zinc in 1926 against 21,200 tons in 1925, 16,000 tons of tin against 15,000 tons, 16,700 tons of lead compared with 12,800 tons and 24,300 tons of aluminum as against 31,100 tons in the preceding year.

Copper consumption by the industry was greatest in 1925, while consumption of other nonferrous metals, aluminum excepted, was greatest last year. Aluminum use by the industry was greatest in 1923 when 33,900 tons was consumed.

The figures for copper consumption do not include metal used in generators while lead in paint and batteries is not included but that used in solder and bearings is. Lead used in automobile batteries in 1926 is estimated at 104,500 tons.

The zinc used in the automobile industry enters mainly in the form of brass, while much of the copper reported consumed enters in the form of alloys.

Seven manufacturers of electric systems for 1926 report copper wire consumption as 6599 tons and other forms of copper used as 3595 tons while brass use during the year was 1169 tons, bronze 250 tons and solder 148 tons.

Wage Parley July 14

Pittsburgh, June 28.—The wage conference between representatives of the Western Bar Iron association and the Amalgamated Association of Iron, Steel and Tin Workers will be resumed in Detroit July 14. The conference at Atlantic City several weeks ago failed to reach an agreement on the proposed contract for the ensuing year.

Operate on E. L. Ford

Edward L. Ford, former president of the Youngstown Steel Co., and son-in-law of J. G. Butler Jr., was operated upon Monday at a Youngstown, O., hospital. His condition is said to be serious.

Bars

Firmness and Better Demand in Bar Market as Third Quarter Needs Are Covered

AT BOTH Pittsburgh and Chicago a pickup is noted in demand for steel bars, though prices are unchanged. At Chicago, the full price is obtained only in the immediate district, eastern steel competing outside. Third quarter contracts are well completed. Alloy and rail steel bars are active and prices are holding up relatively well.

BAR PRICES, PAGE 664

Chicago, June 28.—Soft steel bars are in a better position than other heavy finished material. While 2.00c for bars holds only in the Chicago switching district, bars have enjoyed a real pick-up in both sales and specifications. Sales of all finished material during the week are reported by at least one interest to be better than any week since the first week in May. Inquiries during the week were as good as any week this year. Bookings in the six months now ending are expected to total less than 2 per cent under bookings in the similar six months last year. Farm equipment manufacturers, particularly those engaged in making combines and tractors and those surveying for next spring's business, are increasing specifications for soft steel bars as well as other finished lines. The automotive outlook, while not good for the next 30 to 60 days, has had little effect on active specifications of manufacturers or automotive parts makers. Deliveries on most finished products can be made with little delay. Third quarter contracting is sluggish but is said to be reflecting only the buying habits of consumers.

Alloy steel bar specifications are sufficiently vigorous to keep western mill operations at about 85 per cent. Prices are steady. Rail steel bars are in fairly active demand from the general manufacturing trade. Rail steel fence posts are active. Barn equipment manufacturers have made little headway in third quarter contracting for rail steel bars.

Rail steel bars are quoted at 1.90c to the manufacturing trade. Bar iron is steady at 2.00c, Chicago.

Boston, June 28.—Sales of alloy bars dropped off about 10 per cent for the past week. The market is quiet and no large sales were made during the week. Inquiries are quiet. Prices are fairly firm around 1.85c, Pittsburgh.

New York, June 28.—The steel bar market here reflects considerable firmness. Mills which recently dropped the price to 1.80c, base, Pittsburgh, are holding to this figure as a minimum, the only exceptions being to a few preferential consumers, such as the bolt and nut makers. The full current market on steel bars is 1.80c to 1.85c, base, Pittsburgh.

Pittsburgh, June 28.—Merchant steel bar mills report their contract customers are now about all under cover for third quarter at 1.80c and 1.85c. Nothing now is being quoted at less than the 1.80c minimum, which is the level being paid by cold bar finishers. Some smaller tonnage buyers, such as spring makers, are paying 1.85c. One or two Mahoning valley merchant steel bar mills have not started to sign up their contract customers. Jobber buying is small. Specifications during June have been about on a par with May, but in some cases the total for June is less than June a year ago by 10 to 25 per cent.

Small orders for refined iron bars are being placed at 2.75c.

Cleveland, June 28.—Demand for soft steel bars has increased moderately in the past week. Some users will not take in shipments the week of July 4, being down for vacations and inventory. Small lots are priced at 1.85c, Pittsburgh, but the bulk of current business is going at 1.80c.

Detroit, June 28.—Due largely to inventory taking and new automobile models, shipments of steel bars into this district have declined but mid-July is expected to show a pickup. For some makers sales to date are ahead of 1926. Expected buying by Ford Motor Co. has not developed. Fewer third quarter contracts than last year are reported, more users going over to spot buying. Large business commands 1.80c, Pittsburgh, but moderate-size sales are reported at 1.85c. Low delivered prices are quoted on bars for water shipment. Sellers say small buyers demand the same price as tonnage users.

Philadelphia, June 28.—Steel bar bookings in June are somewhat above May for some mills. Prices continue firm at 1.80c to 1.85c, Pittsburgh, depending upon circumstances and sizes of tonnages.

Finished Holds At 1.80c

Philadelphia, June 28.—On opening of bids today on the Pennsylvania railroad's inquiry for 25,000 tons of plates, shapes and bars for the third quarter the low bid was 1.80c, base, mill, with Chicago district mills quoting 2.00c, mill.

Roups Valley forge, later known as "Tannerhill" was erected in 1830 near Thomas, Ala. It now is owned by the Republic Iron & Steel Co.

Structural Shapes

Demand Carrying Along Awards at Seasonal Level Despite Lack of Large Projects —Inquiries Indicate Good Third Quarter

FABRICATED structural steel awards weekly are holding up to seasonal normal. Large tonnage projects generally are lacking, the week's awards including only two lettings of size. Most awards are small, and a large quantity of work involving 5 to 50 tons at a time is being placed. Fabricators are in a better position generally than expected in regard to bookings, but competition for business is so sharp that fabricated quotations show a wide spread. Plain material quotations continue variable, with 1.70c, Pittsburgh, the minimum for most eastern business, 1.80c for the Central West, excluding the Chicago district which holds at 2.00c, Chicago. Aggressive selling by one or two mills is credited with the weakening in present structural prices.

STRUCTURAL SHAPE PRICES, PAGE 1676

New York, June 28.—Buying is slightly easier but the heavy volume of tonnage before the trade gives the local structural steel market an active aspect. This includes three projects mentioned last week as aggregating more than 20,000 tons. The week's largest award calls for 5000 tons for a telephone building in Newark, N. J. Fabricated material prices, while showing little gain, appear to be holding their own. Plain shape prices may be quoted at 1.70c to 1.80c, Pittsburgh, on the general run of sizable jobs, the market showing little variation.

Boston, June 28.—A substantial amount of small work in the local structural field is being figured in spite of the gradual decline in the volume of building. The decline is more noticeable in the larger work. Prices on plain material hold fairly steady at 1.75c, Pittsburgh, or 2.115c, delivered.

Pittsburgh, June 28.—A number of large jobs are up in the Pittsburgh area, but these mostly are in projected form or in the formative stage. They include a 33-story office building, as yet unidentified; a 22-story office building for the Koppers Co., and a 19-story building for the Keystone Athletic club which is being financed. Structural shape mills are carrying over much second quarter tonnage into the third quarter and contracting for the latter period has not been extensive as yet. Prices quoted are 1.80c to 1.85c, depending upon the tonnage.

Buffalo, June 28.—Fabricators in this district believe they will have their best quarter of the year starting July 1. Various New York Central construction projects involve close to 10,000 tons of structural steel of which 2000 tons already has been placed and more than 7500 tons is pending. Probably a dozen other buildings requiring lots of 50 to 800 tons are under construction. A new fabricating company, the Buffalo Fabricators, Inc., is constructing a plant in Hopkins street and will begin operation soon with an annual capacity of 5000 tons. Shapes will be obtained from the Bethlehem Steel Co.'s Lackawanna plant.

Detroit, June 28.—The 7000 tons of structurals for the First National Bank building addition, taken by the Russell Wheel & Foundry Co., is the largest award in several weeks. Fabricators are only fair buyers of plain material. The shape market tends toward 1.80c, Pittsburgh, although small lots are priced slightly higher.

Chicago, June 28.—Several prospective structural jobs are being held over until autumn. Only a few of the fabricating shops are working with comfortable backlogs. Makers still **claim 2.00c, Chicago,** is the general price on plain material.

Cleveland, June 28.—Numerous small tonnage awards in this territory were made in the past week to ten days. Large projects are scarce. Plain material prices are steady at 1.80c to 1.85c, Pittsburgh, the minimum being for attractive business.

Fabricated material quotations are keenly competitive, a recent attractive tonnage in western Ohio going about $60 a ton fabricated and delivered.

Philadelphia, June 28.—Structural shape bookings by eastern mills are somewhat less. Prices range from 1.90c to 2.12c, delivered Philadelphia, according to circumstances, while on large tonnages, even lower is done.

Awards Compared

	Tons
Awards this week	32,555
Awards last week	23,515
Awards two weeks ago	35,900
Awards this week in 1926	27,369
Average weekly awards, May	31,932
Average weekly awards, 1927	34,469
Total awards to date, 1926	758,299
Total awards to date, 1927	894,304

CONTRACTS PLACED

7000 tons, addition to First National Bank building, Detroit, to Russell Wheel & Foundry Co.

5000 tons, telephone exchange for the New York Telephone Co., Broad street, Newark, N. J., to American Bridge Co.

4000 tons, Engineers club building, Wells street and Wacker drive, Chicago, to American Bridge Co., as announced two weeks ago, contract noted last week being rejected by owners.

3000 tons, Buncombe county court house, Asheville, N. C., to Virginia Bridge & Iron Co.

2353 tons, involved in the following awards: Havermyer Telephone exchange, Broadway and Vietos place, Longhurst, Long Island, N. Y.

Children's house for Hitchcock Memorial church, Scarsdale, N. Y., both to Eidlitz & Ross.

A Sentinel building, Hempstead, Long Island, N. Y., Structural Steel Corp., general contractor.

Office building for Shroeder & Koppel, Sixtieth street and Madison avenue, New York.

2-story factory building, 614 East Fourteenth street, New York, John H. Carl & Son, general contractors, all going to Levering & Garrigues Co.

14-story apartment for the 121 Seventy-Second Street Corp., 117 East Seventy-second street, New York, T. E. Rhoades Co., general contractor, to Taylor-Fichter Steel Construction Co.

2000 tons, New York Central railroad power house, Buffalo, to Lackawanna Steel Construction Co.

1750 tons, Woodward high school, Toledo, O., to American Bridge Co.

1100 tons, storage shed, International Harvester Co., East Moline, Ill., to Worden-Allen Co.

1000 tons, bridge for Western Pacific railroad, near Marysville, Calif., to American Bridge Co.

700 tons, Methodist church building at Tulsa, Okla., to Patterson Steel Co.

640 tons, Pennsylvania railroad bridge over Nickel Plate tracks, East Seventy-ninth street, Cleveland, to American Bridge Co., through P. J. Keehn & Co., general contractors.

500 tons, loft building, 216 East Forty-sixth street, New York, to Jones & Laughlin Steel Corp.

500 tons, court house, Uniontown, Pa., through Engstrom & Wain, Wheeling, W. Va., general contractors, to unstated fabricator.

500 tons, two plant additions for Anaconda Copper Mining Co., Anaconda, Mont., to Kansas City Bridge Co.

420 tons, extensions to South Meadows station, Hartford Electric Light Co., Hartford, Conn., to Fort Pitt Bridge Works.

400 tons, plant for Johnson Motor Co. at Waukegan, Ill., to Austin Co.

320 tons, apartment, 1940 Vallejo street, San Francisco, to Central Iron Works.

300 tons, Vendome hotel, Evansville, Ind., to International Steel & Iron Co., Evansville, Ind.

300 tons, Anchor Fence Post Works, building in Baltimore, to Austin Co.

300 tons, business building, West Fifty-second street, New York, to Easton Structural Steel Co.

250 tons, northeastern pumping station, Philadelphia, to Belmont Iron Works.

250 tons, building for General Motors Corp., Thirty-seventh and Liberty avenue, Pittsburgh, through Everett-Winters Co., Detroit, general contractor, to Jones & Laughlin Steel Corp.

250 tons, miscellaneous work in eight of 10 jobs in the Pittsburgh territory, to Fort Pitt Bridge Works.

210 tons, plant building for John Deere & Co., Waterloo, Iowa, to Rochester Bridge Co.

200 tons, Howey Scheine theater, Lima, O., to Bellefontaine Bridge Co.

200 tons, drawbridge, Sarasota, Fla., to Nashville Bridge Co.

200 tons, building for Wildman Mfg. Co., Norristown, Pa., to Austin Co.

184 tons, Pearl Methodist Episcopal church, Omaha, Nebr., 39 tons; cattle runway, Cudahy Packing Co., Sioux City, Iowa, 99 tons, and Cudahy building, Omaha, Nebr., 46 tons, all to Paxton & Vierling Iron Works, Omaha, Nebr.
175 tons, new store and office building, Malden & Melrose Gas Light Co., Boston, to New England Structural Co.
170 tons, cab ramp, Pennsylvania station, New York, to American Bridge Co.
165 tons, apartment, Stockton and Union streets, San Francisco, to Central Iron Works.
160 tons, State theater, Toledo, O., to Donovan Wire & Iron Co.
158 tons, four jobs, including 62 tons for Anaconda Copper Mining Co. and Lamprecht Creamery Co. building at Milwaukee, to Austin Co.
150 tons, armory, Atlantic City, N. J., to Belmont Iron Works.
150 tons, building for American Electrical Works, Phillipsdale, R. I., to Austin Co.
150 tons, building for Wisconsin Appleton Co., South Milwaukee, Wis., to Austin Co.
150 tons, miscellaneous work, mostly high tension towers, for Duquesne Light Co., Pittsburgh, to W. N. Kratzer Co.
150 tons, store and office building, Berkeley and Newbury streets, Boston, for H. F. Winslow, to New England Structural Co.
150 tons, Manasquan canal, Point Pleasant, N. J., to American Bridge Co.
140 tons, state school for the blind, Vancouver, Wash., to unnamed interest.
120 tons, building for International Lead Co., East Chicago, Ind., and for Superior Laundry Service Inc., Spokane, Wash., to Austin Co.
120 tons, West Side avenue bridge, Central of New Jersey railroad, Jersey City, N. J., to Bethlehem Steel Co.
120 tons, Bingham Stamping & Tool Co. building, Toledo, O., to unstated fabricator.
100 tons, building for Pennsylvania State college, Philadelphia, to Austin Co.
100 tons, plant for Caterpillar Tractor Co., Peoria, Ill., to Austin Co.
100 tons, two projects in Ketchikan, Alaska, for W. F. Schlothan and Sunny Point Packing Co., to Austin Co.

CONTRACTS PENDING

New Inquiry and Developments on Projects Previously Reported

7500 tons, New York Central railroad passenger station, Buffalo; bids in July 16.
6000 tons, South Broad street subway, Philadelphia; previously noted as subway work.
2300 tons, state viaduct, route one, section 13, Newark, N. J.
2000 tons, state highway bridge between Norfolk and Portsmouth, Va.; Atlantic Bridge Co., low bidder.
1450 tons, state viaduct, Sparkhill, N. Y.; bids open July 1.
1400 tons, builders exchange, San Francisco; project abandoned.
900 tons, Beggs building, Columbus, O.; plans filed.
700 tons, 9-story apartment, Clark street, Brooklyn, N. Y.
625 tons, branch city hall at San Pedro, Los Angeles, Union Iron Works low bidder.
550 tons, theater at Milwaukee; contractors' bids in.
550 tons, office building for Stamford Gas & Electric Co., Stamford, Conn.; previously noted as unstated tonnage.
500 tons, theater at Royal Oak, Mich.; steel bids in.
500 tons, theater at South Bend, Ind.; pending.
500 tons, floor of Girard avenue municipal bridge, Philadelphia.
400 tons, two transit sheds, Oakland, Calif.; bids in July 5.
300 tons, caissons for Chesapeake & Ohio railroad bridge, Cincinnati.
350 to 500 tons, Wilkinsburg, Pa., high school; bids close July 12.
300 tons, Pythian temple, Wheeling, W. Va.; bids in.
250 tons, courthouse addition, Pittsfield, Mass., J. R. Hampson Co., Pittsfield, general contractor, $127,700.
250 tons, Knights of Columbus building, Richmond Hill, Long Island, N. Y.
250 tons, Green Point Savings bank, Brooklyn, N. Y.
200 tons, dormitory and attendants' building, school, Exeter, R. I.; bids asked.
200 tons, ten girder spans for Calaveras bridge for Southern Pacific railroad, San Francisco; bids in July 5.
200 tons, boiler house extensions for Union Carbide & Carbon Co. at South Charleston, W. Va.
200 tons, lift bridge at Miami, Fla.; Fred T. Ley Co., general contractor.
150 tons, state highway bridge near Williamsport, Pa.; bids being taken.
146 tons, structurals and 37 tons, concrete bars, bridge and highway, Caddo Parish, La.; bids in July 1 by J. T. Bullen, engineer, 618 Slattery building, Shreveport, La.
135 tons, Regent Square school, Pittsburgh; general contract awarded Kilpatrick-Dawson Co.
100 tons, American Agricultural building, Buffalo; George Schaaf, contractor.
Unstated tonnage, state office building, Trenton, N. J.; J. Osborne Hunt, Trenton, architect.
Unstated tonnage, Young Women's Christian association building, Warren, O.; B. W. Edwards, chairman of building committee.
Unstated tonnage, bridge, Providence, R. I., to cost $400,000, figuring plans.

Concrete Bars

More Projects Being Figured and Placed but Small Tonnages Predominate

CONCRETE reinforcing bar sellers report more inquiries and orders but slight difference in the tonnage being booked. Large tonnage awards are few but heavy inquiries continue to appear in the market. Prices in the past week reflected a tendency toward greater steadiness although competition between rail and billet steel continues tense in some districts.

REINFORCING BAR PRICES, PAGE 1676

Chicago, June 28.—Numerous new billet and rail steel reinforcing awards of less than 100 tons are being placed, which in the aggregate are important. Chicago board of education is figuring on a number of additional school buildings. Billet steel has been specified more frequently in recent school estimates. Rail steel is selling at 2.00c to 2.10c for lots of 100 tons and more, while billet bars range from 2.15c to 2.55c.

Boston, June 28.—New business for immediate delivery in reinforcing bars is exceptionally slow. Prices are holding at 1.90c, Pittsburgh. Warehouse prices range from 2.80c to 2.90c.

Buffalo, June 28.—June sales of reinforcing bars showed substantial increase over May. Few large tonnages were booked but a large number of small orders made a good aggregate. July outlook is fairly good, with 1500 tons pending for a new warehouse, a large tonnage, not completely figured, for the New York Central station, and several smaller lots ready for early placement. Mill shipments are being entered by sellers of new billet steel at 2.165c, Buffalo. Stock lots are being taken at 2.65c, delivered, Buffalo.

Pittsburgh, June 28.—Concrete bar awards seem to be confined to the small structures taking up to 35 tons each. Considerable road work is contemplated, but lettings this past week have been few. Jobs up for attention are numerous. Point Warehouse Co., Pittsburgh, will take bids this week on the superstructure of its new warehouse involving 1200 tons. Billet steel concrete bars are quoted at 1.80c to 1.85c.

Cleveland, June 28.—Total awards of concrete reinforcing bars in this territory would not exceed 300 to 400 tons, according to several sellers. Inquiries of the week were confined to a few 5 to 50-ton projects. No action has been taken on several pending projects requiring more than 4000 tons. New billet bar prices remain 1.80c, Cleveland, for mill delivery, or 2.50c and up, Cleveland, for shipment from stock. Rail steel is 1.65c to 1.75c, mill.

Awards Compared

	Tons
Awards this week	4,038
Awards last week	6,510
Awards two weeks ago	8,780
Awards this week in 1926	3,447
Average weekly awards, May	5,491
Average weekly awards, 1927	5,455
Total awards to date, 1926	149,739
Total awards to date, 1927	140,423

CONTRACTS PLACED

600 tons, high school, Park boulevard, Oakland, Calif., to Frederick Steel Co.
400 tons, apartments, Philadelphia, to American Steel Engineering Co.
250 tons, boardwalk, Wildwood, N. J., to Truscon Steel Co.
245 tons, rail steel, central police station and jail, Chicago, to Olney J. Dean & Co.
150 tons, rail and billet steel, garage at 332 South Franklin street, Chicago, to Olney J. Dean & Co.
125 tons, milk dealers' bottle exchange, Blue Island avenue and Lincoln street, Chicago, to Joseph T. Ryerson & Son, Inc.
100 tons, garage, Hubbard Woods, Ill., to Joseph T. Ryerson & Son, Inc.
300 tons, billet steel, high school, Green Bay, Wis., to Concrete Engineering Co.
300 tons, Segal garage, Philadelphia, to Kalman Steel Co.
258 tons, bridge over Calaveras river near Oakland, Calif., to unnamed interest.
250 tons, Arcadia silk mills, Philadelphia, to Truscon Steel Co.
200 tons, northeastern pumping station, Philadelphia, to Baker Warehouse Co.
200 tons, paving, San Mateo county, Calif., to unnamed interest.
185 tons, building for International Harvester Co., Chicago, at Fifty-fifth street, Cleveland, to Bourne-Fuller Co.
175 tons, including Pennsylvania railroad bridge across Monongahela river, through Pitt Construction Co., general contractor, and 25 tons of road work, to Kalman Steel Co.
100 tons, miscellaneous work in Pittsburgh district to Concrete Steel Co.
100 tons, miscellaneous work in Pittsburgh district, including Regent Square school, 25 tons, building for General Motors Corp., 35 tons, to Truscon Steel Co.

100 tons, Flickinger warehouse, Jamestown, N. Y., to Kalman Steel Co.

CONTRACTS PENDING

New Inquiry and Developments on Projects Previously Reported

1200 tons, superstructure of warehouse for Point Warehouse Co., Pittsburgh; bids to be asked this week; 225 tons foundations—bids closed June 23.
1000 tons, Terminal warehouse, Buffalo; Park-Lapp Co., contractors.
500 tons, piers, Terminal warehouse, Buffalo; Whitney Bros., contractors.
500 tons, subway work, Philadelphia.
300 tons, Engineers' club, Wells street and Wacker drive, Chicago.

Investigates Enameling of Sheet Steel

Common practice in the manufacture of vitreous enamel-coated sheet iron and steel articles is to apply first a coating which is a dark color, and over this to apply two coats of white enamel to give the desired brilliant white finish, says the bureau of standards, discussing this matter. The bureau says that the first coat is dark because it contains cobalt and other oxides which enhance its ability to adhere to the iron, but if a white first coat can be applied which is sufficiently adhesive a total of two coats will suffice and a saving in manufacturing costs results. There is now in progress at the bureau an investigation to eliminate the necessity for the dark first coat, either through development of a light-colored enamel which by virtue of its composition has an adhesiveness comparable to that of a cobalt enamel, or through improving the technique of application so that a white enamel will adhere sufficiently, or both.

Standardizes Cutters

Subcommittee No. 5 on the standardization of milling cutters of the committee on the standardization of machine tool elements has just completed its first report on the proposed American standard for shell end mills and cutter clamping screw. The proposed standard is now in page proof form and is being broadly distributed for further criticism and comment. Sponsoring organizatons are the National Machine Tool Builders' association, Society of Automotive Engineers and the American Society of Mechanical Engineers. Comments should be addressed to T. R. Jones, American Society of Mechanical Engineers, 29 West Thirty-ninth street, New York.

German Exports Increase

German exports of metalworking machinery in 1926 were the highest since 1920 and have been exceeded only by that year and 1913, a report of the industrial machinery division of the bureau of foreign and domestic commerce shows. Valuation of the 1926 exports of metalworking machinery was 94 million marks, or 15 per cent more in value than ever before exported by Germany.

Rails, Cars

Expanding Railroad Activity Encourages Market—Rails and Accessories More in Demand

A BROADER movement in railroad purchasing of steel products than in past months is noted. Secondary rail inquiries of 175,000 tons, heavier purchases and requests for track accessories at Chicago, and inquiry by several eastern roads for third quarter materials feature developments of the week. First half car awards expected to exceed those of same period of 1926.

RAILROAD TRACK MATERIAL PRICES, PAGE 1676

New York, June 28.—Although devoid of large lists, car orders are more numerous. Inquiry is slack. The locomotive market is dull. Preliminary estimates of domestic freight car awards for June place the total cars involved at 6000 the largest business since January, when 14,385 cars were placed. Assuming a 6000 total for June, the total for the first six months should amount to 39,425, as against 35,783 for the first half of 1926.

Advices from Japan indicate that two important rail tonnages on which bids were taken here recently are slated to be placed with the Imperial Steel Works of Japan. One of these orders involves 81 miles of 100-pound rails and accessories for the Hanwa Electric railway, of which 27 miles are to be delivered this year and the remainder next year. The other involves 55 miles of 60-pound rails and accessories for the Chosen railway.

New York Central has put out inquiries for its miscellaneous requirements, bids to close on June 30. Included are 2000 tons of plates, shapes and bars, 300 tons of billets, 350 tons of blue annealed, black and galvanized sheets, 2000 locomotive boiler tubes, 2000 axles and other materials.

Erie railroad is inquiring for its third quarter steel requirements but as usual is taking only prices and is not naming any tonnages. Lehigh Valley also has issued an inquiry in the same way.

New York, New Haven & Hartford railroad is inquiring for 3000 kegs of track spikes.

Pittsburgh, June 28.—Light rail orders are more limited. A few single carloads are sold every week to coal mining sections in nearby territories. Pennsylvania railroad closed bids yesterday on its track accessory inquiry and local makers expect to share in the award before the week end. Prices are holding firmly to 2.80c on spikes; 2.35c on tie plates.

Chicago, June 28.—Further inquiry for standard steel rails gives indication that the secondary rail buying this summer will be heavier than usual. About 175,000 tons of rails is on inquiry, 100,000 tons of which represents actual proposals.

Track fastenings placed during the week include 2000 to 2500 tons of tie plates, 8000 to 10,000 kegs of track bolts, and 8000 to 8500 kegs of spikes. Inquiry for both bolts and spikes has picked up but is mostly for miscellaneous lots. Inquiries call for about 8500 kegs of spikes and 4000 to 5000 kegs of track bolts. Tie plates on inquiry total about 3000 to 3500 tons.

Philadelphia, June 28.—Pennsylvania railroad opens bids June 29 on 50,000 tons of rails for early delivery. This is in addition to the purchase last fall of 180,000 tons with an option on additional 25 per cent. It specified the optional material and with the present 50,000 tons, its total purchases during the current year will be 275,000 tons, probably the largest in its history. This present inquiry is not connected with next year's requirements which will be brought out about November as usual. Philadelphia & Reading placed fair orders for axles during the past week.

CAR ORDERS PLACED

Atchison, Topeka & Santa Fe, two passenger and baggage gasoline-electric rail motor cars to Electro-Motive Co.
Chicago, Burlington & Quincy, five lounge cars to Pullman Car & Mfg. Corp.
Duluth, Missabe & Northern, 250 ore cars, equally divided between General-American Tank Car Co. and Standard Steel Car Co.; this business was reported placed in last week's issue, with 125 going to General-American Car Co.
Illinois Central, 10 baggage cars, to St. Louis Car Co.
Lehigh & New England, one gasoline-electric rail motor passenger car, to J. G. Brill Co.
Litchfield & Madison, 147 solid bottom gondola car bodies and 100 drop bottom gondola car bodies, to American Car & Foundry Co.
Norfolk & Western, 25 all steel storage mail cars, to Bethlehem Steel Co.
Northern Pacific, 10 baggage car underframes, to Siems-Stembel Co.
Seaboard Air Line, 9 gasoline-electric rail motor cars and 10 trailer cars to American Car & Foundry Co. and J. G. Brill Co.
Utah railway, one caboose car, to Mt. Vernon Car & Mfg. Co.

LOCOMOTIVE ORDERS PLACED

Hiram Ricker & Son, Poland Springs, Me., one switch engine, to American Locomotive Co.

CAR ORDERS PENDING

New Inquiry and Developments on Projects Previously Reported

Armstrong Cork Co., Lancaster, Pa., seven tank cars; bids asked.
Fruit Growers Express, 300 underframes.
New York, New Haven & Hartford, 15 baggage car underframes.

LOCOMOTIVE ORDERS PENDING

Denver & Rio Grande Western, two to four Mallet type locomotives; bids asked.
Iquique Pintades, Chile, five locomotives; bids asked.
Missouri Pacific, five locomotives; inquiry out.

Wire

Production Remains Steady with Demand Light—Prices Little Changed but Weak

MANUFACTURING demand for wire is better than from jobbers. In the West better weather is making up in some degree for the late season. Some effort is being made by independent Pittsburgh producers to bring back the usual differential between wire and nails. A low price has appeared in competition on nails, which is ignored by some larger producers.

WIRE PRICES, PAGE 1676

Chicago, June 28.—Western wire mill operations are around 60 per cent, with fair demand from manufacturers. Jobber demand is lagging generally, but recent favorable weather in the Northwest has helped compensate for the late spring and buying has improved in that territory. Producers report less cutting of $2.55 on wire nails than recently. Plain wire is 2.45c, Chicago or western mills.

Worcester, Mass., June 28.—The wire market shows little change in its seasonal lull, but prices remain firm in most instances, sellers believing concessions would not cause buying. Steel and copper specialty and plain steel wire make up most sales. Nails are slow. Spring wire is fairly steady. Utilities have been fair buyers of copper specialty materials. Quoted prices remain 2.55c, Worcester.

Pittsburgh, June 28.—Substantiating their claim that wire products prices are entirely too low, based on production costs, one or two local independent wire nail producers have re-established the $3 differential between nails and wire as a step toward stabilization. They are making the price on nails firm at $2.55, allowing wire to remain where it was, 2.40c. Some did not officially reduce their $2.55 price, simply meeting competition. All makers have ignored the $2.45 price developing in one or two directions, as quoted by some brokerage house. Sales lately have been limited, jobbers not being successful in promptly moving even limited stocks. Operations are held in check at an average of about 50 per cent. Specifications against manufacturing wire contracts are fairly good in the aggregate although individual lots are small.

Detroit, June 28.—Demand for wire products holds up well but prices show a wide variation. Irregularities of $1 and sometimes more under the 2.40c, Cleveland-Pittsburgh, price on plain wire and $2.50 on wire nails are reported.

Philadelphia, June 28.—Makers generally yesterday advanced to $2.55, Pittsburgh, on nails, restoring the old $3 differential between nails and wire. Rods also were advanced, to $43.

C. H. Beach, manufacturers' agent, has been elected chairman of the Indianapolis chapter of the American Society for Steel Treating. Others elected were: A. T. Hagerty of Muncie, vice-chairman; E. J. Fisher, treasurer; and S. Marlow, secretary.

Strip Steel

Specifications Against Third Quarter Tonnage Being Filed Freely

STRIP PRICES, PAGE 1676

Pittsburgh, June 28.—Still shipping out material against second quarter contracts at lower figures, strip steel manufacturers already are commencing to receive specifications in fairly good volume against the higher priced third quarter business recently placed on their books. These prices thereby are fully substantiated, 3.00c on stripsheets, 3.25c on cold strips, 2.10c on hot strips, and 2.30c on hoops and bands. Automotive tonnage is relatively smaller than other general consuming lines. Output for the entire first half of this year will not be more than 5 per cent below the same period in 1926. Strip mill operations average 80 to 85 per cent.

Detroit, June 28.—Automotive consumers are more inclined to concede the recent advances in cold rolled strip and with makers apparently holding firmly the market has a better tone. Hot strip continues firm at 2.30c and 2.10c, Pittsburgh, depending on width.

Cleveland, June 28.—Strip steel demand is spotty. One or two makers claim fair third quarter contracts have been booked, while several other sellers are impatient at the delay in buying. Prices on hot strip remain firm at 2.30c, Pittsburgh, for up to 6-inch and 2.10c for 6 to 12-inch. No shading on ordinary business has been noted. Cold finished strip is firm at 3.25c for 1 to 3 tons, and 3.00c, for carloads, base Pittsburgh.

Cold Finished Steel

Third Quarter Contracting Being Done at Existing Price Levels

COLD FINISHED PRICES, PAGE 1676

Pittsburgh, June 28.—Considerable progress has been made in connection with third quarter contracting by cold finished bar users. Customers, satisfied that the 2.30c price inaugurated June 18 is as low as they can obtain, have signed up in a fairly liberal way. Specifications have been furnished for July in some instances by consumers in automobile and allied lines. Tonnage is well distributed, various lines of manufacture being represented among tnose specifying at a better rate now than in May or early June. Operations average 65 to 75 per cent, and one local interest reports operating some of its machines in the drawing department double turn.

Detroit, June 28.—Demand for cold finished steel is more regular than for most hot rolled products. Specifications for early July specifications show a slight dip, attributed to inventory taking and bringing out of new automobile models. The governing quotation is 2.30c, Pittsburgh.

Bolts, Nuts, Rivets

Contracts for Third Quarter Being Made Without Resistance

NUT AND BOLT PRICES, PAGE 1676

Chicago, June 28.—Third quarter contracting for bolts, nuts and rivets is proceeding at a rate satisfactory to makers, buyers accepting present quotations with practically no resistance. Specifications from some manufacturing lines are good, but producers serving farm implement makers feel the reaction of the off season for that industry. Some delay in shipments is requested because of the approach of July 1 inventory. Large rivets are being contracted for on the basis of 2.85c, Chicago, for carloads, and 3.10c for smaller lots. Small rivets are 70, 10 and 5 to 70 and 10 off.

Pittsburgh, June 28.—Progress is reported in the signing up of nut, bolt and rivet customers for third quarter. Nut and bolt contracts are at 70 off, and tonnages are in many cases commensurate with second quarter shipments. Contracts for rivets are at 2.75c, but customers without contracts are asked to pay 3.00c. Small rivets, ¼ to ⅞-inch inclusive, are quoted at 70 and 10 off. Specifications against the present quarter's business are about all in. Operations average 60 to 70 per cent.

Legal Head Over Exports

Washington, June 28.—After inquiry and based upon considerations of economy, the federal trade commission has transferred the work of its export trade division to its legal division. A new section of the legal division has been created and designated the export trade section, and the chief counsel has been assigned to have direct supervision of the new section and the administration of the export trade act, which has to do with associations engaged solely in export trade.

Nonferrous Metals

Trend of Prices Uncertain with Slow Demand Ruling—Copper and Tin Ease Off but Lead and Zinc Are Holding

Prices of the Week, Cents a Pound

	Copper			Straits Tin		Lead	Lead East	Zinc	98-99%	Spot	Ingot
	Electro delivered	Lake delivered	Casting refinery	New York Spot	August	New York	St. Louis	St. Louis	Aluminum	Antimony	Nickel
June 22	12.50	12.62½	12.37½	67.87½	64.75	6.40	6.15	6.20	25.37½	12.25	35.00
June 23	12.55	12.65	12.40	67.75	64.75	6.40	6.15	6.20	25.37½	12.12½	35.00
June 24	12.62½	12.65	12.45	66.87½	64.37½	6.40	6.15	6.20	25.37½	12.25	35.00
June 27	12.62½	12.70	12.45	66.50	64.50	6.40	6.15	6.22½	25.37½	12.12½	35.00
June 28	12.55	12.70	12.45	66.00	64.37½	6.40	6.15	6.22½	25.37½	12.00	35.00

NEW YORK, June 28.—The nonferrous metals are moving slowly. Demand is practically absent and the trend of the market as a whole is uncertain with price tests practically lacking. Some strength appeared to be developing late last week, but the upturn in the market was not lasting.

Heavy stocks of metal are being carried by producers while production is not materially altered from what it was when consumption was much larger than at present. Consumers, knowing the statistical position of the market is in their favor, are buying only for prompt requirements. The summer lull in finished product production also is a factor in slowing up demand for raw materials.

Copper—Late last week it appeared as though a recovery was beginning in this market. However, the upturn was but momentary and prices again have turned downward. Most producers are asking 12.62½c, delivered Connecticut, but others would accept bids under this level and with a market test lacking it is difficult to determine the bottom of the market.

Zinc—The statistical position of the zinc market favors the buying side, but despite this fact prices have held fairly firm during the past week. Demand is extremely dull but the stronger zinc ore market tends to hold the prime western metal price up.

Lead—Little change has developed in the heavy metal during the past few days. Prices are practically unchanged from a week ago at 6.15c, East St. Louis, and 6.40c New York. The American Smelting & Refining Co. continues to quote 6.40c, New York. The market has been moderately active although the fluctuations in London have exerted considerable influence here during the past few days.

Tin—Prices have tended downward as the tightness in some positions eased off. Premiums on nearby metal have been cut. At the moment not much tin business is expected to be placed in any position until after the July 4 holiday.

Antimony—Demand has not been large but prices have held fairly steady.

Aluminum—Activity in the light metal is limited.

Reports show that 106 meetings were held in 87 cities in the United States and Canada during Oil Power Week, April 18-23. Some 88 different papers were read at these meetings.

Ore Leads Imports at Philadelphia

Philadelphia, June 28.—Imports at this port in the week ending June 25 included 11,654 tons of iron ore from Algeria; 6700 tons of chrome ore from Portuguese Africa; 38 tons of ferromanganese from England; 1905 tons of pig iron from British India; 300 tons of pig iron from the Netherlands; 144 tons of steel bars from Sweden; 102 tons of steel bars from Belgium; 230 tons of structural shapes from Belgium and five tons of hoop steel from Belgium.

Ore first was mined underground in Alamaba in 1875. It was shipped to the Oxmoor furnaces now owned by the Tennessee Coal, Iron & Railroad Co., Oxmoor, Tenn.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
High brass	17.50
Copper, hot rolled	21.25
Lead full sheets (cut ¼c more)	10.25
Zinc, (100-pound base)	9.75
Aluminum, bright flat, up to 10 gage	35.50
SEAMLESS TUBES	
High brass	22.37½
Copper	23.25
RODS	
High brass (round ⅝ to 2½-in.)	15.25
Naval brass	15.00
WIRE	
Copper, small lots	14.25
High brass	16.00

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	9.00
Chicago	9.00
Cleveland	9.50
HEAVY YELLOW BRASS	
Chicago	6.50 to 6.75
Cleveland	7.00
ZINC	
New York	3.75 to 4.00
Cleveland	3.50
HEAVY COPPER AND WIRE	
New York	10.50
Boston	10.25 to 10.50
Chicago	9.75 to 10.00
Cleveland	9.75 to 10.25
RED BRASS BORINGS	
New York	8.00
YELLOW BRASS TUBING	
Cleveland	7.00
LIGHT COPPER	
New York	9.00
Chicago	8.50 to 9.00
Cleveland	9.00
LIGHT BRASS	
Boston	5.00 to 5.25
Chicago	6.00
Cleveland	5.00
ALUMINUM	
Clippings, Cleveland	19.00
Borings, Cleveland	10.00
Cast, Cleveland	14.00
Cast, Boston	13.50 to 14.00

Secondary Metals

Remelt aluminum No. 12	18.50 to 19.50
Brass ingot, 85-5-5-5	11.75 to 12.00

Coke By-Products

Phenol Is Easier—Toluol Supplies Short—Sulphate of Ammonia Quiet

New York, June 28.—While sellers of toluol are able to meet requirements of customers, supplies still are far from plentiful. Prices are strong but unchanged at 35 cents, works, for toluol in tank lots, and 40 cents in drums. These prices also are being done in solvent naphtha. Pure and 90 per cent benzols are holding at 23 cents, works, in tank lots, and 28 cents in drums, and commercial xylol at 36 cents, works, in tanks, and 41 cents in drums.

Pending seasonal contracting, sulphate of ammonia continues quiet. Naphthalene is quiet and unchanged. Due to the late season, there is continued fair demand for flakes. In fact, there is even a suggestion of scarcity, with a contributing factor the somewhat slower production due to warm weather. This situation, however, is not expected to last much longer. Phenol is easier, with 20 cents quoted in some quarters and even less in others.

Coke Oven By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot	Contracts
Pure benzol	$0.23	.....
90 per cent benzol	0.23	.....
Toluol	0.35	.....
Solvent naphtha	0.35	.....
Commercial xylol	0.36	.....
Phenol	0.18 to 0.20	.....
Per Pound at Producers' Plants		
Naphthalene flakes	0.05½ to 0.06½	
Naphthalene balls	0.06½ to 0.07½	
Per 100 Pounds Delivered		
Sulphate of ammonia	$2.40	.....

Warehouse

June Volume Compares Well with May but Shows Drop from 1926—Prices Hold Firmness with Increases Expected

SLOWING of sales in some districts prevented June warehouse totals from exceeding May. Generally the volume was above May but under June, 1926. Prices tend upward, but revisions of the list are few. Philadelphia jobbers contemplate charging quantity differentials on small orders.

Jobbing demand in the New York metropolitan district continues to reflect seasonal slackness, although a fair activity is noted in some products, including black sheets and structurals.

The beginning of summer has brought decline in Toronto, Ont. warehouse markets. While this is not as pronounced as a year ago, it is felt by both Toronto and Montreal distributors. No further changes have been made in warehouse prices, but there appears to be some unsettlement and prospects are that further revisions will be made soon.

Arrival of more seasonal weather at St. Louis has helped distributors of iron and steel. The call from the country is more nearly normal than for months. Despite the flood, demand from the cotton belt for mill and compress supplies is active and up to the levels of the corresponding period last year. There is also a much better demand from the lumber camps in Arkansas, Mississippi and northern Louisiana. The movement of wire fencing and wire products generally to the country since the middle of June is reported the best since last fall. Quieter conditions are reported in the general manufacturing trade.

Warehouse sales in the Chicago district in June have been holding fairly well to those of May and will show little falling off from 1926. Prices are unchanged except on cold finished shafting and screw stock, for which quantity extras have been added.

Philadelphia jobbers report June bookings exceeding May. Prices generally are unchanged although the recent minimum figures reported on bars tend to be highly exceptional. Some tendency has developed here to charge quantity differentials on small orders but this is not yet general.

Demand for warehouse products at Detroit is weak, although satisfactory for June 1. Operators regard the outlook for July as favorable and are maintaining heavy stocks accordingly. Structural products continue in heaviest demand with the balance of consumption being fairly well distributed. Prices are steady and unchanged.

Cleveland jobbers report June totals of varied amounts. Better than May but below June, 1926, seems the general summary of sales during the month just ending. Prices are holding firm on all products, the only change of the week being an increase of $3 a ton on galvanized sheets from 3.50c to 3.65c, by the leading sheet distributor. The new price is effective June 29.

Warehouse Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Baltimore	2.60c to 3.31c
Buffalo	2.75c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.15c
Ft. Worth	3.50c
Los Angeles	3.30c
New York	3.24c
Philadelphia	2.60c to 3.20c
Pittsburgh	2.85c to 2.90c
Portland	3.00c
San Francisco	3.30c
Seattle	3.00c
St. Louis	3.15c
St. Paul	2.80c to 3.20c
Tulsa	3.80c to 4.06c

IRON BARS

Baltimore	2.60c to 3.31c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.15c
Ft. Worth	3.50c
New York	3.24c
Philadelphia	2.60c to 3.20c
St. Louis	3.15c
Tulsa	3.80c to 4.06c

REINFORCING BARS

Baltimore	2.70c to 3.31c
Boston	3.265 to 3.50c
Buffalo	2.75c
Cincinnati	3.00c
Cleveland	2.50c to 2.70c
Detroit	3.15c
Ft. Worth	3.50c
*Los Angeles	3.05c
**Los Angeles	3.30c
New York	3.10c to 3.15c
Philadelphia	2.80c to 3.00c
Pittsburgh	2.50c to 2.75c
*San Francisco	2.85c
**San Francisco	3.10c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.50c to 2.60c

*Carload. **Less carload.

STRUCTURAL SHAPES

Baltimore	2.60c to 3.41c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.25c
Ft. Worth	4.00c
Los Angeles	3.20c
New York	3.34c
Philadelphia	2.60c to 3.20c
Pittsburgh	3.00c
Portland	3.10c
San Francisco	3.30c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.80c to 4.16c

PLATES

Baltimore	2.60c to 3.41c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-inch and thicker	3.00c
Cleve., 3/16-in.	3.20c
Detroit	3.25c
Detroit, 3/16-inch	3.45c
Ft. Worth	4.50c
Los Angeles	3.20c
New York (sheared and universal	3.34c
New York (floor)	5.25c
Philadelphia	2.60c to 3.20c
Phila., 3/16-in.	2.80c to 3.40c
Pittsburgh	3.00c
Portland	3.25c
San Francisco	3.30c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.80c to 4.16c

No. 10 BLUE ANNEALED SHEETS

Baltimore	3.15c to 3.66c
Boston 3/16-inch	3.915c
Buffalo	3.80c
Chicago	3.50c
Cincinnati	3.60c
Cleveland	3.25c
Detroit	3.65c
Los Angeles	4.00c
New York	3.89c
Portland	4.00c
Philadelphia	3.30c
Pittsburgh	3.30c
San Francisco	4.00c
Seattle	4.00c
St. Louis	3.60c
St. Paul	3.75c
Tulsa	4.05c to 4.25c

No. 24 BLACK SHEETS

Baltimore	3.60c to 4.00c
Boston	4.95c
Buffalo	4.30c
Chicago	3.95c
Cincinnati	4.05c
Cleveland	3.75c
Detroit	4.10c
Ft. Worth	4.70c
Los Angeles	5.00c
New York	4.20c
Philadelphia	4.35c
Pittsburgh	3.75c
Portland	4.75c
San Francisco	4.80c
Seattle	4.75c
St. Louis	4.45c
St. Paul	3.95c
Tulsa	4.75c

No. 24 GALVANIZED SHEETS

Baltimore	4.30c to 4.60c
Boston	5.65c
Buffalo	5.15c
Chicago	4.80c
Cincinnati	4.90c
Cleveland	4.65c
Detroit	5.05c
Ft. Worth	5.75c
Los Angeles	5.75c
New York	4.95c
Philadelphia	5.20c
Pittsburgh	4.60c
Portland	5.50c
San Francisco	5.35c
Seattle	5.50c
St. Louis	5.25c
St. Paul	4.80c
Tulsa	5.55c

BANDS

Baltimore	3.20c to 4.06c
Boston	4.015c
Buffalo	4.05c
Chicago	3.65c
Cincinnati	3.95c
Cleveland	3.65c
Detroit	3.80c
Ft. Worth	4.40c
Los Angeles	4.05c
New York	3.99c
Philadelphia	3.40c
Pittsburgh	3.60c
Portland	4.25c
San Francisco	4.15c
Seattle	4.00c
St. Paul	3.90c
Tulsa	4.71c

HOOPS

Baltimore	4.16c
Boston	5.50c
Buffalo	4.05c
Chicago	4.15c
Cincinnati	4.40c
Cleveland	3.65c
Detroit	4.30c
New York	4.49c
Philadelphia	3.65c
Pittsburgh	4.25c to 4.50c
Seattle	5.00c
St. Paul	4.40c

COLD FINISHED STEEL

	Rounds, hexagons	Flats, squares
Baltimore	3.50-4.00c	4.00-4.50c
Boston	4.05c	4.55c
Buffalo	3.95c	4.45c
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.65c	4.15c
Detroit	3.85c	4.35c
Los Angeles	5.25c*	.....
New York	4.00c	4.50c
Philadelphia	4.00c	4.50c
Pittsburgh	3.60c	4.10c
Portland	5.00*	.....
San Francisco	4.25c*	.....
Seattle	5.00c*	.....
St. Paul	3.85c	.....
Tulsa	4.66c	5.16c

*Rounds only.

COLD ROLLED STRIP

Boston, 0.100-inch, 500-lb. lots	6.00c
Buffalo	5.85c
Chicago*	6.10c
Cincinnati	7.15c
Cleveland*	5.95c
Detroit*	6.05c
New York	5.75c
Philadelphia	5.50c

*Net base, straightening, cutting, boxing one ton or more.

SWEDISH IRON AND STEEL

New York duty paid

Hollow drill steel	14.00c
Iron bars, rounds	6.25c

Flats and Squares

Baltimore, New York, Phila.	6.60c

Coast Trade Is Irregular

Structurals and Pipe Most Active and More Business Is Coming Out Steadily

SAN FRANCISCO, June 25.—*(By Air Mail)*—Demand for iron and steel products on the Pacific Coast has been spotty and with one or two exceptions bookings have involved small tonnages only. While a good deal of new work is being planned, which will require some substantial tonnages of steel, the projects are slow in coming forth for figures. Prices continue to hold at the levels that have prevailed for the past month or two. Consumers are being urged by some mill representatives to cover for their requirements now before the new ocean freight rates go into effect.

Pig Iron And Coke

Foundry activity is not pronounced and the market is bare of fresh inquiries of importance. Sales reported have involved unimportant tonnages. About 2000 tons of English and German foundry coke is scheduled to arrive in port during the first week in July. Most of this material will apply against contracts already placed. No change is noted in prices on pig iron.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	25.00
*Dutch	24.50

*C.i.f. duty paid.

Bars, Plates And Shapes

During the past week or ten days two shipments of foreign steel have arrived in port. Included in this shipment was approximately 500 tons of merchant bars, 500 tons of structural shapes and 100 tons of rails. Other miscellaneous steel products brought the total close to 1500 tons. Local bar mill operators report demand light for mild steel. Awards of concrete bars this week aggregated 1259 tons, bringing the total for the year to 25,150 tons, compared with 17,626 tons for the corresponding period in 1926. The largest award is 600 tons for a school in Oakland.

The Southern Pacific railroad has an inquiry out for 210 tons of rivets. Prices on this material appear firm at 2.75c, base, Pittsburgh, or equivalent, although a higher price, around 3.00c, is expected to prevail during third quarter.

Plate awards were confined to small lots. Awards this year to date total 45,072 tons, compared with 46,810 tons for the same period last year. Pending business is not of heavy proportions, less than 2500 tons being up for figures or pending. New inquiries of the week include 210 tons for a pipe-line at Santa Maria, Calif., and over 100 tons for a standpipe at Clackamas, Oreg. Plans are being prepared by the Spring Valley Water Co., San Francisco for a 54-inch pipe line from San Andreas to Laguna Honda reservoir, a distance of about 12 miles. Bids will oe opened next week on a 400-ton gas holder for the Pacific Gas & Electric Co. Prices apparently are firm at 2.30c, c.i.f. Coast ports.

Structural shape awards this week were heavier than for any week since the first of May, totaling 1734 tons and bringing the total for the year to 79,328 tons, compared with 68,931 tons for the corresponding period in 1926. Included among the larger lettings was 900 tons for a bridge for the Western Pacific near Marysville, Calif., booked by the United States Steel Products Co., and 320 tons for an apartment in San Francisco, taken by the Central Iron Works. Pending business exceeds 8000 tons. Bids were opened this week on 625 tons for the branch city hall at San Pedro, Los Angeles. Prices are firm at 2.35c, c.i.f.

Other Finished Material

More inquiries for standard pipe are noted. Included among pending business is 700 tons of pipe for Santa Maria, 265 tons for Clackamas, Oreg., 162 tons for Los Angeles, 109 tons of 2 inch galvanized and 4, 6 and 8-inch Matheson for the Ravenswood water district, Redwood City, Calif., 100 tons for the Hetch Hetchy project, San Francisco, and 60,000 feet of galvanized pipe for Seattle.

Awards of cast iron pipe totaled 1134 tons, bringing the aggregate for the year to 48,638 tons, compared with 35,307 tons for the same period last year. The largest award involved 500 tons for San Diego. Pending business calls for over 9000 tons. Bids will be opened next week for 2300 tons for Tucson, Ariz., and July 6 for 1658 tons for Clackamas, Oreg.

Northwest Buying Fair

SEATTLE, June 24.—The jobbing trade in iron and steel is active, the volume showing an increase. Mill representatives state business is fair and while no large projects are up for figures, much work of importance is scheduled for action soon. The foundry situation is quiet. General business conditions in the Pacific Northwest are reported better than normal.

Montana will open bids July 13 and 29 for about $1,000,000 in road construction. Bids for road work in Alaska to cost $100,000 have been opened at Juneau. Government road work in Oregon, Washington, Idaho and Montana is receiving much attention, Multnomah county, Oregon, has received bids for work to cost over $400,000.

About Aug. 1, it is reported, officials at the Puget Sound navy yard expect to begin work on the construction of the $7,500,000 cruiser, contract for which was recently awarded. A large force of skilled labor will be required. Todd Dry Docks, Inc., Seattle, will complete a $100,000 repair job on the French steamship ARKANSAS, June 29, four days ahead of contract time. The same yard is also completing a large contract on the American steamship SUREMICO.

Pig Iron and Coke

The foundry trade is quiet. Many plants in this territory are operating only part time and no new work of importance is in sight. Recent arrivals of imported shipments of coke are ample for present needs. Small quantities of Columbia iron are being sold for prompt delivery.

Less business is being offered local steel mills, construction specifications having fallen off. Merchant bars remain firm and unchanged at 2.35c but there is no market on reinforcing material, which is being sold at 2.00c or less. The only new job up for figures involves 250 tons for the state college at Corvallis, Oreg. Seattle will open bids June 24 for the Fairmount avenue bridge involving 122 tons of steel.

Plates are unchanged at 2.30c. Jobbing houses report a fair volume of trade in light gages for tank and boiler work but no large tonnages are up. No action has been taken on 1500 tons involved in the proposed water pipe job at Astoria, Oreg.

Structurals are reported firm at the minimum level of 2.35c. The only award of the week involved 30 tons for the Willapa river bridge, general contract going to the Willapa Construction Co., Raymond.

Interest Shown in Pipe

Interest in pipe is active, several large tonnages being involved. The American Cast Iron Pipe Co. last week booked 1200 tons for Tacoma. The same firm was also awarded 268 tons at Seattle, as well as about 200 tons for a Seattle extension, general contract to the Interstate Construction Co. Award of 450 tons for the Harvard avenue job, Seattle, is still pending as are also bids for a system at Silverton, Oreg., opened by Baar & Cunningham, Portland, consulting engineers. Bids will be opened July 6 by H. L. Gilbert, consulting engineer, Couch building, Portland, for the Clackamas, Oreg., water district, involving about 160,000 lineal feet of 3 to 12-inch steel and cast iron pipe.

Users Safe If Fluorspar Duty Is Raised

New York, June 28.—In commenting on decision of tariff commission to hold hearings beginning July 22 to determine whether the duty on fluorspar should be increased, importers say most eastern consumers anticipated such a development by buying supplies of fluorspar well ahead. They say that practically every consuming plant in the East has sufficient fluorspar on hand or on order to last at least through this year, and in some cases beyond. All of the material thus stocked is said to be foreign fluorspar and importers, taking a chance on the possibility of an increase in the duty, sold it duty paid.

Thus, consumers stand to make a material profit should the duty be advanced. On the other hand, importers who sold duty paid, without making any stipulation with respect to an increase, now are uneasy about the possible result of the hearings. Should the duty be increased 50 per cent before they deliver all the tonnage they have on order, they will be out considerable money. In fact, the present duty being $5.60 a gross ton, they would be out exactly $2.80 on every ton should the present duty be advanced 50 per cent and, of course, their commissions on the sales by no means would equal the duty increase.

Prices on foreign fluorspar of the 85 and 5 per cent grade are somewhat lower and this material now may be quoted at $16 to $16.50 per net ton, duty paid.

Canadian Output Ahead of 1926 Figures

Toronto, Ont., June 28.—Production of pig iron in Canada in May amounted to 78,987 long tons, an increase of 2 per cent over 77.240 tons in April and 9 per cent above May, 1926. In the five months ending with May 1927 production of pig iron in Canada totaled 334,276 tons, an increase of 11 per cent over the 300,010 tons in the first five months of 1926.

Production of steel ingots and castings during May amounted to 96,711 long tons a decline of 11 per cent from 109,107 tons in April, but 8 per cent over the 89,513 tons made in May of last year. For the first five months of the year the production totaled 427,370 tons an increase of 22 per cent over the 349,907 tons produced during the corresponding period of last year. This year's output included 406,950 tons of steel ingots and 20,420 tons of direct steel castings.

Sharpsville Furnace Co. Loses Rate Complaint

Harrisburg, Pa., June 28.—The public service commission on June 25 dismissed the complaint of the Sharpsville Furnace Co., operator of a blast furnace at Sharpsville, Pa., against freight rates charged on pig iron shipments from Sharpsville to Butler, Pa. Complaint was made against the Baltimore & Ohio, Bessemer & Lake Erie, Erie, New York Central, Pennsylvania and Pittsburgh & Lake Erie railroads. It was set forth that the rates gave undue advantage to competitors of the company in Pittsburgh and 10 other points in Pennsylvania and Ohio.

American Engineers Given Czech Medals

For eminent service to Czechoslovakia, six American engineers have received the Cross of Knight of the Czechoslovak Order of the White Lion. They are Prof. Joseph W. Roe, head of the department of industrial engineering, New York university, New York; Calvin W. Rice, secretary, American Society of Mechanical Engineers, New York; Alfred D. Flinn, director, Engineering Foundation, New York; Lawrence W. Wallace, executive secretary, American Engineering council, Washington; H. S. Person, managing director, Taylor society, New York; and Morris L. Cooke, industrial engineer, Philadelphia. The order was created "in accordance with the approval of the president of the republic as decoration for citizens of foreign states in appreciation of their services rendered on behalf of the Czechoslovak State."

Pig Iron Demand Light

(*Concluded from Page* 1677)

to $18 for outside sales, though less is being done in competitive territory.

Philadelphia, June 28.—More foundry iron inquiries feature the market. Inquiries, however, generally involve lots of 1000 tons or less. Purchases in the past week were small. Eastern Pennsylvania foundry iron continues $21.50 to $22, base, furnace. Several lots of low phosphorus iron were sold, aggregating around 1000 tons. They show copper free continues $25, furnace, and copper bearing $24, furnace. Considerable basic buying is expected in about two weeks.

Cincinnati, June 28.—Some fairly good sales of pig iron were reported in the past week. Louisville & Nashville railroad placed 700 tons with southern and northern furnaces. Columbus Malleable Iron Co. ordered 1200 to 1500 tons for last half. A Michigan melter purchased 1500 tons of foundry iron. Anderson Stove Co. placed 1500 to 2000 tons. The sale of 1200 tons of silvery iron also was noted. Norfolk & Western railroad is inquiring for 500 tons of foundry iron. Prices are steady.

Chicago, June 28.—Estimates place the amount of third quarter pig iron tonnage sold thus far at not over 25,000 to 30,000 tons. Several large buyers are inquiring and some additional tonnage has been placed. About 3000 tons of No. 2 foundry, malleable and specialty iron has been sold to a Milwaukee melter for third quarter at $20, Chicago furnace. Part of this tonnage was taken by two steelworks furnaces. A melter in the Tri-Cities district has taken 2000 tons of No. 2 foundry, also for third quarter. Owing to silicon differentials, the price is reported to figure slightly below $20, Chicago furnace. Several melters in the Chicago switching district have taken iron at $20, including one purchase of 200 tons of No. 2 foundry. A Chicago melter is inquiring for 500 tons of foundry. A Milwaukee melter has taken two cars of silvery at the Jackson county, O., schedule, and another Wisconsin user is inquiring for a carload. Several orders for charcoal iron have been placed in this district at $27.04, delivered, Chicago. A few 500-ton lots of low phosphorus iron have been closed. The market for 1 to 2 per cent low phosphorus is reported at $31 to $31.25, with some offers reported below this range.

St. Louis, June 28.—Orders for pig iron are more numerous and diversified. Indications point to the closing of some large tonnages within the next two weeks. Sales during the past week totaled approximately 4000 tons, of which quantity the leading local producer booked 3500 tons. Mills and foundries are more optimistic as some unexpected business has developed. Jobbing foundries, particularly those specializing in building materials, have booked good orders. The market is quotable at $20 to $20.50, f. o. b. Granite City. Northern iron is unchanged at $20, base Chicago, and Southern is quoted at $18, base, Birmingham.

Birmingham, Ala., June 28.—Though the future is uncertain for blast furnace interests there is no reason for any immediate readjustment as to foundry iron. Blowing out of furnaces is looked for, but so far no addition has been made to the surplus stock on furnace yards, and tonnages on consumers' yards are small. Deliveries are active. Quotations still are at $18, base, Birmingham.

Four electric railway cars were exported in March, all going to Canada. Canada took 28 and Jamaica 35 of 104 freight cars exported.

Mexico received 4834 gross tons of car wheels and axles from the United States in 1926, a larger amount than taken by any other country.

Wages in Bar Iron Mills Are Unchanged

Pittsburgh, June 28.—Wages in bar iron mills having contracts with the Amalgamated Association of Iron, Steel and Tin Workers will continue in July and August at the same levels as in March, April, May and June. The puddling rate will remain at $11.13 per ton. The average price of bar iron in May and June was 1.95c, as determined by representatives of the Western Bar Iron association and the Amalgamated association. Following is a comparison of reported price averages:

	1927	1926	1925	1924	1923
Jan. Feb.	1.95c	2.00c	2.00c	2.35c	2.25c
Mar.-Apr.	1.95c	2.05c	2.35c	2.35c	1.50c
May-June	1.95c	2.00c	2.05c	2.25c	2.50c
July-Aug.	.....	2.00c	1.95c	2.15c	2.50c
Sept.-Oct.	.....	2.00c	1.95c	2.10c	3.40c
Nov.-Dec.	.....	2.00c	1.95c	2.05c	2.35c
Yearly av.	.....	2.00c	1.99c	2.21c	2.30c

Will Sell Iron Output of Charcoal Iron Co.

Hickman, Williams & Co. announce that they have become the exclusive sales representatives for the charcoal iron produced by James D. Lacey & Co., operating agents for receivers of the Charcoal Iron Co. of America, with furnaces at Newberry and Manistique, Mich. These furnaces produce the Cicoa brand of charcoal iron. Hickman, Williams & Co. will handle this iron from all their sales offices at Chicago, St. Louis, Cincinnati, Detroit, Pittsburgh, Cleveland, Philadelphia, New York and Boston.

Expands Research Work

Work on problems in industrial research involving an expenditure of $105,000 will be done for different industrial corporations next year by the department of engineering research of the University of Michigan, Ann Arbor, Mich. This is an increase of nearly 100 per cent over the amount of work done last year, when the figures showed approximately $60,000. In addition to the sum already mentioned, the department has in view other research work involving a further expenditure of about $60,000.

Groups for which the work will be done and the amount involved in each case are as follows: Detroit Steel Products Co., $3000; Detroit Edison Co., $35,000; Cook Spring Co., $2500; Foundry Research Group, $2500; Timken-Detroit Axle Co. and Timken Roller Bearing Co., $18,000; Kelvinator Corp., $6000; A. C. Spark Plug Co., $10,000; Warner Gear Co., $6000; American Gas association, $10,000; National Electric Light association, $5000; Association of Natural Gasoline Manufacturers, $8000.

Pig Iron Again Moves by Water from St. Louis

St. Louis, June 28.—A shipment of 1000 tons of pig iron, the first out of St. Louis by river in nearly half a century, has been dispatched to Newport, Ky., via the Mississippi and Ohio rivers by the St. Louis Coke & Iron Corp. The tonnage was the first of about 30,000 to 50,000 tons which will be similarly handled within the next year. M. D. Curran, vice president of the corporation, says his organization plans to take full advantage of river transportation. It proposes within the next two or three years to own and operate its own fleet of towboats and barges. The first shipment of pig iron represents a saving of $1.13 per ton compared with the all-rail rate. It is planned to bring back coal in the empty barges for the company's by-product coke plant.

Beehive Coke Production Still Declining

Beehive coke production slumped in the week ended June 18, being 136,000 net tons compared with 141,000 tons in the week preceding and 185,000 tons in the corresponding week of 1926, states the bureau of mines. For the calendar year to date output of beehive coke has been 4,217,000 tons, against 6,304,000 tons last year.

Bituminous coal output of 8,283,000 tons in the week ended June 18—a drop of 241,000 tons from the preceding week—brought the year's total to 262,147,000 tons. Last year at this time production stood at 250,711,000 tons.

Murray Body Buys Plant

Murray Body Corp., Detroit, according to report from that city, has bought the Jenks & Muir Mfg. Co., large producer of springs and other materials for automobile assembly. The plants will be operated separately, with Christopher E. Coda, vice president and general manager, in charge of the purchased plant.

Shipments of enameled sanitary ware in May totaled 374,519 pieces, compared with 373,288 pieces in April and 424,156 pieces in May 1926, reports of 22 manufacturers to the department of commerce show.

Clinton Stack Gives Way To Terminal

Pittsburgh, June 28.—Purchase of the plant and property of the Clinton Iron & Steel Co. by the Pittsburgh & Lake Erie railroad, subsidiary of the New York Central, will be followed by an extensive program of enlarging its terminal facilities between the Smithfield street and Point bridges. This purchase said to have approximated $2,000,000, followed three others. In March, 1926, the railroad took title to 255,130 square feet at East Carson and South First streets from the Pittsburgh & West Virginia railroad, for a consideration of $1,200,000. The ground was utilized to rearrange team tracks and to construct a modern yard. In May, 1926, the railroad purchased the Painter Mill property in West Carson street from Carnegie Steel Co. This included 245,027 square feet and was sold for $796,337. About the same time, the Crucible Steel Co. sold it its Singer Mill adjoining. This involved a tract of 299,248 square feet and the consideration was $674,354. The old mill buildings were razed and at the time purchase was made it was announced by the railroad that the properties would eventually be improved with adequate warehouse and terminal facilities.

The present purchase comprised all the land, with riparian rights, owned by the Clinton company, lying between the Monongahela river on the north and the Pittsburgh, Cincinnati, Chicago & St. Louis railroad on the south, on both sides of West Carson street, approximately 500,000 square feet and according to I. Newton Lewis, of L. J. Phillips & Co., New York, having a property value of about $4,500,000. The Clinton Iron & Steel Co. is capitalized at $300,000, having been incorporated July 9, 1889. The rated annual capacity of the furnace is 110,000 tons. One year is given for its dismantling.

Builds New Type Truck

Penton Motor Co., Cleveland, has been organized with E. W. Penton president, J. Fred Potts secretary-treasurer and Henry Sherman vice president. Its product will be a motor-driven milk delivery truck with new features to reduce cost of frequent stops. The new motors are being built at the plant of the Van Dorn Iron Works Co., Cleveland. One truck a day is the present rate of production.

Testing Society Completes Extensive Program at 30th Meeting

SINCE its inception as the American Section of the International Association for Testing Materials, in 1898, the American Society for Testing Materials has met each year in an eastern city, with the exception of 1899 at Pittsburgh and 1901 at Niagara Falls. Following the incorporation in 1902, an event which was commemorated in the twenty-fifth anniversary celebration this year, every annual meeting of the society has been held in an Atlantic Coast city.

The convention, held in French Lick, Ind., June 20 to 24, 1927, deviated from past precedent. Although the attendance did not reach the total registered in previous years, the amount of business transacted paralleled closely the accomplishments of this exceptionally busy organization.

General meetings of committees and conferences of sub-committees occupied the first day of the convention. These were followed by sessions occupying the remaining four days, of which four were devoted to metals and two to questions relating to conducting the affairs of the society. The A. S. T. M. now has a total membership of 4220 of whom more than 500 attended the French Lick meetings. The society has 45 standing committees with a total membership of more than 2000 persons interested in the study of engineering materials and the development of standard specifications.

Outline Year's Work and Announce New Officers

FOLLOWING a day spent on committee deliberations, the thirtieth annual convention of the American Society for Testing Materials was called to order by President J. H. Gibboney, chief chemist, Norfolk & Western Railway Co., Roanoke, Va., June 21. In his opening remarks the president dwelt upon the growth and increasing usefulness of the society in promoting knowledge of engineering materials. He suggested wear resistance as a future line of investigation.

Prof. H. F. Moore, University of Illinois, Urbana, Ill., presented the report of the committee on correlation of research, showing many important investigations promoted directly by the society or carried on jointly with other technical organizations. Among other activities is a series of tests on the method for determining yield point of structural steel, a study of corrosion-resistant alloys and the effect of temperature upon properties of metals.

C. L. Warwick, secretary of the society, in reporting on the activities of standing committees, reviewed the classification of committee memberships as established by the society, into producers, consumers and general interests. The latter group is made up of engineers, educators and others who are neither producers nor consumers. A number of changes were made in the mode of operation of committees, including the provision that a two-thirds majority of a committee shall approve a report before its submission to the society, and dissenting members shall have a right to present a minority report. Editorial sub-committees to standing committees, having as their duty the review of present standards and of proposed new ones, is proposed by this committee.

The announcement of the election of officers by a committee which canvassed the ballots showed the following new officers who assumed their duties at the close of the convention: President, H. F. Moore, professor of engineering materials, University of Illinois, Urbana, Ill.; vice president, T. D. Lynch, manager, materials and process engineering department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; members of the executive committee, F. O. Clements, director of research, General Motors Corp., Detroit; W. H. Klein, general superintendent, Dixie Portland Cement Co., Richard City, Tenn.; F. C. Langenberg, metallurgist, Watertown Arsenal, Watertown, Mass.; and Climax Molybdenum Co., New York; and F. N. Speller, metallurgical engineer, National Tube Co., Pittsburgh. The adjournment of this session was followed immediately by the convening of the session on wrought and cast iron and magnetic testing.

Refer Code for Valve Steel Back To Committee

SUGGESTED new specifications for carbon steel valves, flanges and fittings for high temperature service aroused unprecedented interest among the delegates at the thirtieth annual convention of the American Society for Testing Materials, evidenced by an attendance of more than 200 at the morning session Wednesday. The expected discussion drew a large representation from the steel castings producing field, from organizations of foundrymen and from those who saw in the proposed specifications a precedent that might promise mischief in the future.

However, this discussion did not materialize. When J. B. Young, Reading, Pa., the chairman of the general committee on steel, submitted this portion of its report, the statement was made that the committee was by no means unanimous in its recommendations. In fact the analysis showed that 57 had voted affirmatively, 23 negatively and 66 had refrained from voting. Immediately, Prof. A. E. White, University of Michigan, Ann Arbor, Mich., representing the National Electric Light association, which is said to have backed the offending specification, moved that the specification be referred again to the committee. This motion was seconded and carried unanimously. President Gibboney, from the floor, commended the generosity of the consumer members of the steel committee for this action; and Major R. A. Bull, Electric Steel Founders' Research Group, Chicago, remarked upon the

appropriate and gracious action of Prof. White.

Thus ended a situation which promised controversy, and in a measure reflected the popular judgment on the matter at issue. This particular specification, after three year's deliberation contained the statement:

"The steel shall be made by one or more of the following processes: open-hearth or electric-furnace."

The dissenting members of the committee and many entirely disinterested parties, felt that in specifying these processes, the A. S. T. M. unfairly discriminated against the crucible and converter methods of steel making.

A second point of difference was found in that portion of the specification that gave physical limits and further set up the following requirements for chemical composition:

	Per cent
Carbon	0.15-0.45
Manganese	Not under 0.50
Silicon	Not under 0.20
Phosphorus	Not over 0.05
Sulphur	Not over 0.05

The limitations placed upon carbon and manganese were not assumed to be unreasonable, but thus defining them was thought to constitute an invasion of the rights of the producer to make the castings according to his own best practice, as long as the physical requirements were met.

The American Foundrymen's association at its recent convention in Chicago passed unfavorably upon the specifications, and a steel session voted to refer a complaint to the executive committee of the American Society for Testing Materials which met Monday, June 20, at French Lick, Ind. Neither the executive committee nor the steel committee of the society, which met on the same day, felt free to stop the progress of the proposed measure at the stage to which it had advanced. The action on the floor of the convention, at the instance of Prof. White, cut the Gordian knot, and the offending specification again is returned to the general committee and through it to the subcommittee which sponsored it originally.

Specifications Are Adopted

Other recommendations of the committee on steel passed and were approved without comment. These include the adoption of recommendations on specifications for various types of forgings, carbon and alloy steel bars for spring service, boiler and firebox steel, welded iron boiler tubes and welded and seamless steel tubes. Proposed revisions in specifications for automotive carbon and alloy steels were withdrawn, but new specifications for alloy steel bolting material for high temperature service were recommended for adoption.

In addition revisions were approved in specifications for forged and rolled steel pipe flanges and lap-welded and seamless steel pipe for high temperature service and for cold rolled strip steel. New standards were proposed tentatively for structural steel for locomotives and cars, for marine boiler steel plates and for alloy tool steel.

Terminology Is Discussed

John Howe Hall, Taylor-Wharton Iron & Steel Co., High Bridge, N. J., in presenting the report of the committee on heat treatment of iron and steel, commented upon the tentative definitions of terms relating to heat treatment operations. He called attention to some objection voiced to defining annealing as a heating and cooling operation of a material in the solid state. This definition with the remainder of the report was adopted, with the understanding that it will be amplified to take care of the variations in different lines of work.

E. F. Kenney, Bethlehem Steel Co., Inc., Bethlehem, Pa., who presided at this session, next introduced George K. Burgess, director, United States bureau of standards, Washington, who presented the report of the joint committee on the investigation of the effect of phosphorus and sulphur on steel. Dr. Burgess stated that a study is being made of the effect both of residual sulphur and that which is added to both fabricated and cast steel. No results of practical value have been found in the latter field and by recommendation of steel foundrymen, who point to the ill effects of hot shortness experienced in steel castings when the sulphur is carried above a minimum, this phase of the investigation probably will not be carried forward.

Detailed results on test bars of open-hearth steel with varied carbon contents and with different amounts of phosphorus were presented. Further, the effect of phosphorus and sulphur on structural steel shapes has yielded results in which it has been shown that sulphur in commercial steel plate is not detrimental in amounts up to 0.077 per cent.

In commenting on this report, Frank N. Speller, National Tube Co., Pittsburgh, remarked that the American Petroleum institute announced that in class B, lapwelded pipe, phosphorus increased from 0.045 to 0.08 per cent gave greater welded strength and that the endurance limit goes up proportionately with the phosphorus. Work on the investigation of sulphur and phosphorus effects, according to Chairman Burgess, is being confined to materials at ordinary temperatures with no investigation of high temperature effects upon the steel studied.

M. O. Withey, University of Wisconsin, Madison, Wis., chairman of the research committee on the yield point of structural steel, presented a brief report, reviewing the fundamental problems of the determination of yield point and the testing procedure to be followed. Five laboratories, including a number of the larger steel producers, co-operating with educational institutions, are aiding this work.

S. W. Parr, University of Illinois, Urbana, Ill., presented a paper prepared jointly with F. G. Straub, connected with the engineering experiment station of the university, outlining further study and the development of accelerated tests to determine the effect of caustic and other solutions on steel under conditions of stress. Results of these tests are given in the paper, showing the reactions of different types of steels and the inhibiting effects of sodium sulphate and other compounds upon this so-called embrittlement is outlined. Prof. Parr remarked that the term embrittlement probably is a misnomer, and this was sustained in discussion by D. J. McAdam, United States naval research laboratory, Bellevue, Anacostia, D. C., who suggested that this failure in boiler steel is due to a combined corrosion and fatigue effect.

Foreign Steel Tested

F. G. Straub, co-author of the paper, told of an announcement through the German technical press of a steel made by Krupp's which gave great resistance to this embrittling action. According to the German statements, the Krupp steel resisted caustic attack. Samples of this new boiler steel recently obtained were tested and found to have a yield point of 32,000 pounds and an ultimate tensile strength of 56,000 pounds per square inch. When loaded to 45,000 pounds per square inch in the regular embrittlement tests, this German plate cracked at a time rate of 0.004 square inches per hour, exactly equal to the rate of the standard American plate, but slightly better than the plate previously used in German boiler practice. The analysis of the new Krupp steel is given by the maker as follows: Carbon, 0.15; manganese, 0.44; phosphorus, 0.017; sulphur, 0.023; silicon, 0.04; nickel, 0.026 per cent.

John Howe Hall registered an ob-

jection to the loose application of the term manganese steel to material containing 2.85 per cent manganese, announcing that the term as understood in practice covers steel with manganese over 10 per cent.

F. M. VanDeventer, secretary of the joint research committee of the American Society of Mechanical Engineers and the A. S. T. M. reported studies going forward on the effect of temperature on the properties of metals, in 20 co-operating laboratories. Plain carbon steel, alloy steel and nickel are under investigation, but up to the present attention has been given largely to developing methods of testing. These show that greater uniformity in methods is desired.

The committee on ferroalloys, reporting through its chairman, F. C. Langenberg, Watertown Arsenal, Watertown, Mass., reported that to limit the percentage of under or oversize lumps of spiegeleisen at present would not be commercial. However, ferrosilicon furnished in lump or granulated form is specified as showing no excessive disintegrations.

R. S. MacPherran, Allis-Chalmers Mfg. Co., Milwaukee, closed the morning session, Wednesday, with a paper on tests of chrome-nickel steel at high temperatures. The purpose of the tests outlined is to determine the forging and upsetting properties of the alloys in question. Tests were made on a round bar forged from 5¼ inches to ⅞-inch and annealed.

Discuss Properties of Wrought Iron and Gray Iron

T. D. LYNCH, newly elected vice president of the American Society for Testing Materials, presided at the session devoted to wrought and cast iron and magnetic testing, Tuesday afternoon. At this session G. H. Woodroffe, Reading Iron Co., Reading, Pa., secretary of the committee on wrought iron presented the report of his committee, recommending a number of minor changes in specifications and the elimination of 4½, 7, 9, and 11-inch nominal sizes from the standard specifications for welded wrought-iron pipe. The report of the committee on malleable castings, of which W. P. Putnam, Detroit Testing Laboratory, Detroit, is chairman, recommended tentatively the addition of a minimum yield point of 30,000 pounds per square inch, to be determined either by drop of beam or the divider method.

A feature of this session was the report of the committee on magnetic analysis. A. V. deForest, research engineer, American Chain Co., Bridgeport, Conn., gave a method for representing magnetic characteristics graphically. This method presents a graph of mechanical properties of ferro-magnetic materials and makes it possible to select from these the particular characteristics of importance to the solution of any problem.

J. A. Capp, chief of the testing laboratory, General Electric Co., Schenectady, N. Y. gave an interesting paper on the application of magnetic analysis to inspection of steam turbine bucket wheels. This provides a means of finding hidden defects without destroying the piece examined.

The paper by M. E. Greenhow, Allis-Chalmers Mfg. Co., Milwaukee, read in the absence of the author by H. Y. Carson, American Cast Iron Pipe Co., Birmingham, Ala., gives detailed methods of making a certain type of casting varying from ¼-inch to 1-inch section which had to be close grained, high strength and wear resistant.

The best results were obtained when the total carbon ranged from 2.75 to 3.00 per cent, to attain which steel scrap was used in the charge. The manganese varied from 0.75 to 0.90 per cent, and as higher losses were encountered than in ordinary cast iron, running sometimes to 25 per cent loss, a proportionately higher percentage was required. Silicon varied from 1.25 to 1.65 per cent. Nickel was used to replace a part of the silicon to reduce internal shrinkage.

The percentage substitution of nickle for silicon in this class of castings is 1½ times the silicon deduction in heavy castings to 2½ times in the lighter castings. For example, a certain casting which formerly required 1.25 silicon was reduced to 0.75 per cent of nickel substituted.

The tensile strength of this material ran from 55,000 to 60,000 pounds per square inch. The brinell hardness was usually above 200 but the nickel treated iron machined freely. The machinability of the nickel treated irons, according to test on castings of intricate design was 33 per cent better than was the case with the same iron untreated.

The melting process in making this iron is of prime importance, and as the low carbon of the charge corresponds to a higher melting temperature, the coke to iron ratio was low. The steel stock charged was coil springs, or short rail ends, and small charges were used in the cupola. With these smaller charges, increased coke was used, ranging from 1 to 6½ or 7, and the volume and pressure of the air blast employed in the cupola were increased.

The initial bed charge is important. The bed charge was made up of 40 to 50 inches of coke above the tuyeres. This was ignited and burned to incandescence then an additional six inches of coke was charged and alternate charges of metal and coke were added until about 8 to 10 tons had been charged in the cupola. In making ladle additions all alloys were preheated on account of their higher melting temperatures.

A typical metal charge for a 36-inch cupola is given as follows: 1000 pounds, coil springs; 15 pounds of 50 per cent ferrosilicon. The ladle additions per 100 pounds of metal were as follows: 12 ounces, 70 per cent ferromanganese; 8 ounces, 50 per cent ferrosilicon; 24 ounces nickel shot.

Investigators Report on Their Study of Corrosion

CORROSION, endurance and wear testing occupied the attention of the metals division at the session held Thursday morning under chairmanship of H. F. Moore, University of Illinois, Urbana, Ill. J. H. Gibboney, presented the report of the committee on corrosion of iron and steel, reviewing the work of an extensive committee that for a number of years had conducted tests throughout the country.

The question of copper in sheets is under investigation through long time tests. At Ft. Sheridan Ill. failures during the past year have been divided between copper bearing and low-copper bearing iron. At Annapolis, Md., 20 per cent of the non-copper bearing sheets have failed, while none of the copper bearing samples have succumbed. A sub-committee investigating metallic coated sheets reported no failure during the year in zinc coated specimens.

Revisions in standards for the following classifications were adopted by vote of the assembly: Zinc coated wire and wire products, zinc coated

iron and steel line wire, and zinc coated iron and steel tie wires. In addition tentative galvanized sheet specifications introduced in 1924 and revised in 1927 were passed to standard. Further, new specifications were proposed for the first time for three classes of zinc-coated fence wire and fence fabric. A new subcommittee, under chairmanship of Mr. Gibboney has been established to study metal culvert pipe. At present the activities of the committee will be devoted to corrugated flexible metal, but later cast-iron culvert pipe will be studied.

The committee on corrosion of nonferrous metals and alloys reported progress, through its chairman, T. S. Fuller, General Electric Co., Schenectady, N. Y. Total and alternate immersion and spray tests using different solutions such as sodium chloride, sulphuric acid and sodium hydroxide mixtures of varying intensities are being conducted with test specimens of aluminum, admiralty metal, copper, lead, zinc, tin, bronze and various classes of patented and proprietary alloys. Further exposure tests will be made in various sections of the country after the manner followed by the committee on iron and steel corrosion. A method of graphic representation of corrosion through the number of centimeters penetration per month has been developed by this committee.

An interesting new method for detecting pinholes in plated coatings was explained in a paper by Karl Pitschner, American Chain Co., Bridgeport, Conn. Destruction of the nickel or chromium coating on plated ferrous metal objects is hastened by porosity which cannot be determined by ordinary inspection. Use of the salt spray to develop rust spots not always is successful, since the force of the spray washes away the telltale brown marks. A rather complicated method previously used, involving a coating of gelatinous material carrying salt in solution and potassium ferricyanide, is superceded by the new method known as the *ferroxyl* test devised by Mr. Pitschner.

In this method, paper is coated with a thin film of the solution of salt and potassium ferricyanide, previously mentioned, sprayed on. This surface coating is oven dried, and then if it is desired to test a piece of plated metal, the test paper is moistened with water, placed against the surface and pinholes make their presence known by small spots, varying in color if the defect is in the nickel or other plating color, or if it penetrates the subcoating of copper usually applied.

Reporting the work of the committee on zinc coating of iron and steel, progress is shown but no new specifications were submitted. A group of three papers on corrosion and fatigue testing of metals was presented. The first of these on the effect of corrosion on the endurance limit of thin duralumin was read by R. R. Moore, U. S. air corps, McCook field, Dayton, O. The next, by D. J. Adam, Jr., U. S. naval engineering experiment station, Annapolis, Md., covered a detailed and exhaustive study of the corrosion fatigue of nonferrous metals. Experiments conducted on nickel, nickel-copper, monel metal, copper, aluminum, aluminum-manganese and duralumin were analyzed graphically. The experiments show that even slight corrosion simultaneous with fatigue may cause failure at stresses far below the ordinary endurance limit. Severe corrosion previous to fatigue lowers the resistance much less than slight corrosion simultaneous with fatigue.

The third paper, covering endurance of gray iron under repeated stress, by H. F. Moore and S. W. Lyon, University of Illinois, Urbana, Ill., was presented by the latter. Four casts of gray iron were tested for hardness, and resistance to tension, impact, compression and fatigue.

A paper outlining factors affecting the wear testing of metals was presented by H. J. French, U. S. bureau of standards, Washington. The surface condition of the metal and a condition described as filming interfere with abbreviated tests of this property. Different types of machines, involving the principle of metal to gage or abrasive action were described. Comparison was made between laboratory and service tests.

President Traces Society's Record of Progress

TRACING the history of the American Society for Testing Materials, J. H. Gibboney, in his presidential address Tuesday night, told of the formation of an American section of the International testing society in 1898 and the later establishment by charter of the present organization in April 1902. The work of the society has been conducted upon a plane of complete co-operation between producer and consumer. The early activities were based primarily upon considerations of safety and resulted in specifications for steel rails and structural steel, cement and other building and industrial materials upon which little real information had been available as to physical limits and tests.

Four distinct steps in the development of standards were shown in Mr. Gibboney's address. A method of testing first is established, next definitions as to terms and meanings, then the setting up of specifications and finally the recommendation of practices in utilizing the material, follow. A present trend toward research is evident and the president announced a nucleus of $1000 set aside for research purposes during the past year. This with the formation of a student grade of membership tends to show the broadening scope of the work.

The annual report of the executive committee, which was presented immediately following the address of the president, amplified the former in many details. The organization now has 4220 members of which more than 500 were registered for the French Lick convention. More than forty active committees carry on the work of the society.

Announcement was made of an International Congress for Testing Materials to be held Sept. 12-17, 1927, at Amsterdam, Holland, with the Dutch and Swiss associations acting as hosts. A special committee consisting of T. D. Lynch, chairman, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., P. H. Bates, Bureau of standards, Washington, T. G. Delbridge, Zay Jeffries, Aluminum Co. of America, and G. W. Thompson, National Lead Co., New York, was appointed to plan the American participation. A program of 18 papers to be offered by the A. S. T. M. and the participation and attendance of the authors and other members, has been announced. The remainder of the report of the executive committee, which was prepared by C. L. Warwick, secretary-treasurer, covered the financial affairs of the organization and outlined the participation with other organizations in technical work.

The committee on nomenclature and definitions announced the early publication of a glossary of the 255 standard definitions adopted and 144 additional tentative definitions put forward. These probably will be included in forthcoming book of tentative standards.

The remainder of the evening program was devoted to papers and reports on testing methods and appar-

atus. J. Hammond Smith, University of Pittsburgh, Pittsburgh, told of series of experiments on the rate of elongation in tension tests of rolled and drawn steel. O. S. Peters, bureau of standards, Washington, in a short paper showed the developments made in the electric telemeter, designed to measure and record stresses in such widely different structures as street car rails, the structural members of a rigid airship in flight, etc. A paper by J. T. Nichols, E. S. Taylerson and J. C. Whetzel, all of the American Sheet & Tin Plate Co., Pittsbugh, gives an extensive series of tests on low carbon sheet steel in an effort to determine the best form of test specimen for standardization. The specimen recommended as giving the most satisfactory results has a gage length of 2 inches and a width of ½ inch.

Especial significance was attached to the dinner of the American Society for Testing Materials held Wednesday, June 22, since it commemorated the twenty-fifth anniversary of the incorporation, which was effected June 12, 1902. Past president W. H. Fulweiler, who presided read the roll of individual and firm members who have been continuously affiliated with the society since that date. Of a total of 66 individuals, 17 of the veterans were present and were signalled out for expression of appreciation. James H. Gibboney delivered the anniversary address.

C. L. Warwick, secretary, then presented the names of three men for honorary membership. These are Robert W. Lesley, William R. Webster and A. A. Stevenson. Only Mr. Stevenson, was present to receive the honor conferred. Mr. Warwick reviewed briefly the technical accomplishments of the three. Robert W. Lesley, Surface Combustion Co., Philadelphia, was a pioneer in the use of cement and concrete, starting with the American Cement Co., in 1880. He established the *Cement Age* and was the first president of the Cement association. He was president of the A. S. T. M. from 1900 to 1902.

William R. Webster, the second recipient of honorary membership, was an early investigator of the relations of chemical to physical properties in iron and steel. He became a member of the International testing society in 1898 and was one of the incorporators of the A. S. T. M. He was the first chairman of committee A-1, on steel, and served continuously in that position until 1913.

A. A. Stevenson, Standard Steel Works Co., Philadelphia, the third member honored was the first chairman of the iron and steel committee of the American Institute of Mining and Metallurgical Engineers. Later he was president of the Association of Steel Manufacturers and during the War was chairman of the gun howitzer production club. He was a member of the International Testing society in 1896, before the organization of the American section. He was vice chairman of committee A-1 and served on the executive committee of the A. S. T. M. from 1911 to 1920. He was elected president in 1916 and at present is the society's representative on the American Engineering Standards committee. In his address of appreciation, Mr. Stevenson pointed to the existence of more than 20,000 specifications for 6600 commodities and affrmed that study and simplification of existing standards is imperative.

H. F. Moore, president elect, introduced D. J. McAdam, Jr., U. S. naval research laboratory, Bellevue, Anacostia, D. C. who was presented with the Charles B. Dudley medal in consideration of his paper offered in 1926 on the methods of testing and the effects of corrosion and repeated stress on metals.

Dr. George L. Clark, professor of applied chemistry, Massachusetts Institute of Technology, Boston, gave the second Edgar Marburg lecture, Wednesday afternoon. This lecture which was established in 1926, has for its purpose the presentation of outstanding developments in knowledge of engineering materials. Edgar Marburg, after whom the lecture was named, was for many years secretary-treasurer of the society and is credited with the growth and successful accomplishments of the organization from the period of its incorporation.

The lecture covered the use of the X-rays in industry. Dr. Clark established the first laboratory devoted to the industrial application of the X-rays and for many years has worked and written about the subject.

"Protected" Pay More Than Others

Wage differences between "protected" and "unprotected" industries in Great Britain are compared in a recent survey by the National Industrial Conference board, New York. The report refers to "protected" industries as those in which the output is consumed in the home markets, and to "unprotected" as those in which the product enters foreign markets, and is subject to foreign competition.

The average of weekly earnings in the protected group in 1906, the latest prewar year for which full information is available, was 25s 5d, compared with 60s 4d in 1924. The average in the unprotected group was 27s 11d in 1906, increased to 54s 5d in 1924. The figures for 1924 are obtained from the British Census of Production for that year, recently published.

The average earnings in the protected group increased 140 per cent, while those in the unprotected group were only 95 per cent higher in 1924 than in 1906.

In 1906 the earnings in the unprotected group averaged 10 per cent higher than those in the unprotected industries, but in 1924 the reverse was true, unprotected group earnings averaging about 11 per cent higher than in the other group. This probably reflects results of severe foreign competition, and less stability in those markets, compared with steadily increasing domestic demands.

Receiver Asked for Penn Seaboard Steel Corp.

Appointment of a receiver for the Penn Seaboard Steel Corp. was requested by the Atlantic Refining Co. in a bill filed in the court of chancery at Wilmington, Del., June 24. The steel plant, which is located at New Castle, Del., had been shut down the preceding day by the county sheriff. Claims amounting to $272,617 were filed against the plant by the Pure Oil Co., A. M. Wood & Co., Bethlehem Steel Corp., Wilmington & Philadelphia Traction Co., Delaware Electric & Supply Co. and the Atlantic Refining Co. Plans have been under way for a considerable period to refinance the company, but these apparently have met with failure, and the annual meeting has been postponed several times because of lack of a quorum. The Penn Seaboard plant at New Castle comprises five open-hearth furnaces and blooming and bar mills.

Issues Stripsheet Book

An attractive 64-page booklet entitled "Stripsheets" has been issued by the Columbia Steel Co., Pittsburgh in which the evolution of the product is traced. Seventeen pages are devoted to details of the mill equipment and of the manufacturing process employed. A chapter also is included in which the metallurgical aspects of methods of manufacture are discussed. Over 70 exceptionally clear illustrations are incorporated in the booklet in sequence.

May Exports, Imports Rise

Shipments Increase to 202,708 Tons—Receipts Total 79,814 Tons, Highest Mark of 1927—British India Sends Heavy Pig Iron Tonnage—Far East Market Shows Good Tonnage for First Five Months of Year

EXPORTS and imports of iron and steel in May advanced over the previous month, according to the iron and steel division of the department of commerce. May exports totaled 202,708 tons, the highest mark since January exceeding April where 192,339 tons was shipped. Exports in May, 1926, totaled 173,418 tons.

Iron and steel imports in May totaled 79,814 tons, the high point this year, compared with 60,374 tons in April. However, import tonnage in May, 1926, totaled 108,781 tons. Imports for the first five months of 1927, increased from 63,404 tons in January to 79,814 tons in May.

Imports of pig iron from British India rose from 2149 tons in April to 10,402 tons in May. Iron ore imports from Chile, which last month jumped to 130,300 tons, dropped to 101,500 tons in May. Pig iron imports increased from 8923 tons in April to 17,164 in May, while iron ore receipts dropped to 186,208 tons in May, compared with 239,570 tons in April.

Exports of iron and steel found a good market in the Far East in May, destination figures show. May exports there totaled 59,880 tons compared with 32,600 tons in April. South American shipments were lower in May with 21,921 tons marketed there. At the end of five months in 1927, 252,527 tons were exported to the Far East, compared with 212,481 tons in the corresponding period of 1926. South American exports, at the end of the first five months in 1927 totaled 159,870 tons compared with 144,289 tons in the corresponding time in 1926.

Belgian steel and iron shipments to the United States continue to grow. At the end of the first five months this year, 90,371 tons had been imported from that country, compared with 75,908 tons in the corresponding time last year. India, which in the first five months of last year had shipped 55,933 tons to the

IMPORTS AND EXPORTS

Gross Tons

	—1927—		—1926—	
	Imports	Exports	Imports	Exports
Jan.	63,404	215,235	79,067	174,585
Feb.	49,451	166,128	100,213	157,187
Mar	61,672	171,094	93,107	169,438
Apr.	60,374	192,339	107,636	194,449
May	79,814	202,708	108,781	173,418
June			124,215	159,506
July			82,411	194,717
Aug.			91,578	171,588
Sept.			85,484	182,071
Oct.			81,830	172,070
Nov.			81,259	219,830
Dec.			75,559	198,189
Total	314,915	947,504	1,111,090	2,167,048

ORIGIN OF PIG IRON IMPORTS

Gross Tons

From:	May	April
Belgium		200
Germany	680	285
Netherlands	2,315	3,636
Sweden	72	280
United Kingdom	3,600	2,048
Canada	95	271
Mexico		54
British India	10,402	2,149
Total	17,164	8,923

ORIGIN OF IRON ORE IMPORTS

Gross Tons

From:	May	April
Germany		1,117
Spain		196
Brazil		200
Sweden	9,294	19,934
United Kingdom	24	
Canada	2,365	4,781
Cuba	48,000	44,000
Chile	101,500	130,300
Algeria and Tunis	25,025	38,925
Egypt		4,420
Totals	186,208	239,570

ORIGIN OF MANGANESE IMPORTS

(Concentrates)

Gross Tons

From:	May	April
Germany	16	4
Soviet Russia in Europe	3,227	21,072
Canada	35	
Brazil	3,153	
British India	4,815	2,307
British West Africa	6,977	6,521
Totals	18,223	29,904

ORIGIN OF FERROMANGANESE IMPORTS

Gross Tons

From:	May	April
Italy	17	
France		183
Sweden		1
United Kingdom	240	608
Canada	1,233	1,361
Norway	553	
Totals	2,043	2,153

ORIGIN OF IMPORTS

Gross Tons

From:	Cast iron pipe	Steel bars	Steel scrap	Ingots, blooms, etc.
Belgium	1,644	5,945		219
France	5,613	775		44
Germany		1,738		515
United Kingdom		215	301	7
Netherlands		102		
Sweden		973	20	
Canada			6,357	
Mexico			45	
Other countries		40	27	72
Totals	7,257	9,788	6,750	857

IMPORTS OF IRON AND STEEL

Gross Tons

Product:	May 1927	April 1927	January through May 1927	January through May 1926
Pig iron	17,164	8,923	47,322	273,940
Ferromanganese and alloys*	2,043	2,153	10,792	19,166
Ferrosilicon†	1,080	1,179	5,400	4,038
Ferrochrome††	12	11	382	297
Scrap	6,750	5,500	27,930	22,857
Iron slabs	....	....	....	42
Steel ingots, billets, etc.	857	617	5,509	13,855
Steel bars	9,788	8,840	41,615	40,324
Iron bars	153	659	2,118	2,489
Wire rods	1,388	707	6,002	4,145
Hoops, bands, scrolls	3,375	1,837	12,259	9,343
Boiler and other plate	79	1,336	2,255	1,927
Sheets, skelp, saw plate	1,507	1,191	6,124	2,564
Tin plate	750	38	850	1,394
Structural shapes	14,241	11,796	62,773	33,810
Rails and splice bars	1,139	852	6,876	18,221
Cast iron pipe	7,257	8,738	40,664	20,982
Other pipe and tubes	9,743	3,575	24,861	10,157
Barbed wire	352	328	2,562	2,050
Round iron and steel wire	646	456	1,925	1,621
Steel telegraph and telephone wire	2	1	27	82
Flat wire and strip steel	268	277	1,206	1,098
Wire rope and strand	179	361	1,104	869
Other wire	26	98	229	1,014
Nails, tacks and staples	683	532	2,471	1,242
Bolts, nuts, rivets and washers	11	13	97	225
Castings and forgings	321	356	1,562	1,007
Total	79,814	60,374	314,915	488,759

*Manganese content
†Silicon content
††Chromium content

IMPORTS BY COUNTRIES OF ORIGIN

Gross Tons

	May, 1927	January through May 1927	January through May 1926
Austria	78	381	349
Belgium	19,575	90,371	75,908
Czechoslovakia	548	1,067	653
Denmark and Faroe Islands	23	84	33
Esthonia	2	54	
France	9,115	53,194	61,987
Germany	17,243	61,322	96,224
Italy	20	292	164
Netherlands	2,747	14,606	50,982
Norway	1,177	5,700	5,808
Poland and Danzig	100	360	
Sweden	2,179	9,208	10,369
Switzerland	4	23	6
United Kingdom	7,341	24,969	87,399
Canada	9,202	30,451	28,606
Honduras	4	4	1
Mexico	45	204	172
Cuba	1	2,189	3,599
Dominican Republic	6	21	62
British India	10,402	15,314	
Hongkong	1	5	
Japan, including Chosen	1	15	11
Finland			799
Lithuania			1,530
Panama		19	7,748
Chile			4
India		2,336	55,933
Java and Madura			1
Soviet Russia in Europe			4,619
Spain		24	
Guatemala		7	
British India		4,912	
Other British West Indies			403
French West Indies		120	
Totals	79,814	317,252	488,754

United States, has sent only 2336 tons so far this year. This is due largely to decreased American pig iron buying in India. A drop in the shipments of the Netherlands is also noted, with 14,606 tons shipped from January to May, 1927, compared with 87,399 tons in the corresponding time last year.

Exports of steel scrap to Japan totaled 13,987 tons in May, out of the total exports of scrap of 26,728 tons.

Exports of rails in May to Kwangtung were heavy, 4140 tons being shipped there. Japan received 5949 tons of rails, out of the month's total of 16,554 tons.

EXPORTS OF IRON AND STEEL

Gross Tons

Product:	May 1927	April 1927	January through May 1927	January through May 1926
Pig iron, not including ferro-alloys	4,115	3,753	17,676	7,747
Ferromanganese and spiegeleisen	101	10	218	173
Scrap	26,728	24,395	77,967	49,906
Ingots, blooms, skelp	7,165	7,978	27,239	24,493
Iron bars	297	365	2,029	1,803
Steel bars	8,989	9,209	49,702	59,432
Alloy steel bars	457	445	2,297	2,238
Wire rods	1,065	770	6,987	8,607
Plates	15,925	14,954	60,226	54,181
Galvanized sheets	12,538	14,947	71,844	75,928
Black steel sheets	17,722	11,724	78,065	79,714
Black iron sheets	1,228	1,259	7,239	9,305
Hoops, bands, strip	3,592	3,660	20,804	22,269
Tin plate	18,597	18,159	134,223	85,910
Structural shapes, plain	15,845	13,380	54,371	59,974
Structural materials, fabricated	5,109	5,303	25,595	37,989
Metal lath	342	362	1,778	2,062
Steel rails	16,554	13,919	86,684	56,693
Rail fastenings, switches, frogs, etc.	4,752	2,999	14,886	17,484
Boiler tubes and welded pipe	19,684	25,397	122,954	112,220
Malleable iron screwed pipe fittings	1,067	1,005	4,483	5,422
Cast iron screwed pipe fittings	847	581	2,871	4,188
Cast iron pressure pipe and fittings	1,125	826	4,672	3,631
Cast iron soil pipe and fittings	455	237	3,262	6,329
Plain wire	2,972	3,019	13,166	17,122
Barbed wire and woven wire fencing	5,085	5,289	18,245	26,220
Wire cloth and screening	234	142	959	771
Wire rope	415	481	1,999	2,308
Insulated wire cable	48	28	218	289
Other wire	907	1,051	4,056	3,439
Wire nails	619	627	2,991	5,385
Nails other than wire	499	682	2,856	3,260
Tacks	92	76	399	404
Horseshoes	53	78	202	240
Bolts, nuts, rivets, except track	1,007	1,081	4,784	5,962
Car wheels and axles	4,444	1,347	8,658	7,113
Iron castings	740	1,102	5,231	3,392
Steel castings	660	1,206	3,277	4,302
Forgings	634	493	2,391	1,194
Total	202,708	192,339	947,504	869,099

DESTINATION OF EXPORTS

Gross Tons

Destination	May, 1927	January through May 1927	January through May 1926
North and Central America and the West Indies	109,860	461,799	446,846
Canada and Newfoundland	85,972	356,736	329,600
Cuba	7,132	34,889	38,610
Mexico	10,669	37,533	41,016
Guatemala	501	3,710	6,671
Salvador	718	2,489	9,725
Panama	1,468	7,567	3,566
Other British West Indies	1,273	6,726	3,914
Other West Indies	1,320	6,240	7,566
Other Central America	807	5,909	6,178
South America	21,921	159,870	144,289
Argentina	4,792	35,171	26,396
Brazil	4,408	35,919	16,526
Chile	2,587	11,774	24,604
Colombia	2,641	28,204	26,715
Peru	4,120	13,878	16,865
Venezuela	2,196	27,767	27,832
Other South America	1,177	7,157	5,349
Europe	8,893	63,976	59,323
France	574	1,753	6,691
Italy	977	14,013	18,808
Rumania	122	1,132	1,723
Russia	53	2,118	2,806
Turkey	121	930	672
United Kingdom	4,206	29,861	21,183
Other Europe	2,240	14,168	7,440
Far East	59,880	252,527	212,481
Australia	2,886	14,111	9,132
British Malaya	397	5,314	4,718
China	4,367	29,923	15,751
Dutch East Indies	2,619	18,610	14,970
India	786	13,816	15,240
Japan and Chosen	38,463	131,152	118,241
Kwangtung	5,055	11,965	3,698
Philippine Islands	3,838	20,277	27,198
Other Asia and Far Eastern Markets	969	7,459	3,533
Africa	2,754	9,333	6,160
British So. Africa	1,669	4,196	3,089
Egypt	497	2,178	2,190
Portuguese East Africa	567	2,421	708
Other Africa	21	538	173

DESTINATIONS OF IRON AND STEEL EXPORTS

Gross Tons

Countries:	Rails	Galvanized sheets	Plates not fabricated	Tin, terne plate	Steel sheets, black	Barbed wire	Steel bars	Steel scrap
Argentina		431	40	1,935		488		
Australia		401	8		903	1	230	
Brazil	752	539		706		1,257	265	
British India		127						
British So. Africa		61				206		
British Malaya				104				
Canada	2,070	4,071	12,150	3,301	7,506	589	6,116	11,478
Central America		338	180		75	159	95	
Chile	81	331	235	331				
China	358	171		2,660			17	447
Colombia		772		394		338		
Cuba	1,631	1,016	51	479		349	132	
Dutch East Indies		788						
Dutch West Indies	85							
Europe			15		390			
Other Europe		661		109				
Hongkong								105
Italy				613				
Japan including Chosen	5,949	457		4,719	7,472		170	13,987
Java and Madura				36				
Kwangtung	4,140							
Mexico	515	668	171	1,255	159	479	148	174
Norway		165		223				
Peru	110		143		51		266	
Philippine Islands	459			214	114	347	166	
United Kingdom					34		670	371
Uruguay				581				
Venezuela	60			58				
Total	16,554	12,538	13,139	18,597	17,722	4,621	8,989	26,728

Exports of Metalworking Machinery

In number except where otherwise designated

	May, 1927	May, 1926	January through May 1927	January through May 1926
Engine lathes	52	14	246	121
Turret lathes	20	17	79	57
Other lathes	35	41	174	291
Vertical boring mills and chucking machines	9	5	49	46
Thread-cutting and automatic screw machines	49	44	356	349
Knee and column type milling machines	12	11	100	62
Other milling machines	33	22	153	217
Disk type gear-cutting machines	1	2	6	3
Other gear-cutting machines	41	10	137	89
Vertical drilling machines	16	44	118	168
Radial drilling machines	4	8	32	42
Sensitive drilling machines	90	281	276	544
Other drilling machines	106	81	501	636
Metal-sawing and cutting-off machines	8	22	131	91
Shapers and slotters	22	23	159	373
Planers	4		19	8
External cylindrical grinding machines	42	44	300	243
Internal grinding machines	22	9	150	107
Metalworking tool-sharpening machines	53	130	382	426
Other metal-grinding machines, pounds	66,422	86,832	448,292	359,278
Sheet metalworking machines, pounds	470,700	273,736	1,677,441	1,430,720
Plate metalworking machines, pounds	164,295	19,405	435,235	85,594
Rod or wireworking machines, pounds	40,885	22,738	153,748	187,827
Forging machinery, pounds	320,383	427,803	1,528,630	2,520,838
Rolling-mill machinery, pounds	725,687	421,323	3,471,904	2,210,139
Foundry and molding equipment, pounds	951,674	390,448	2,928,302	2,072,467
Other power-driven metalworking machinery and parts, pounds	452,070	453,168	2,703,057	3,349,317
Hand or foot operated metalworking machinery and parts, pounds	14,446	5,466	141,403	81,358
Pneumatic portable tools	1,458	1,154	7,305	8,216
Other portable metalworking machines, pounds	30,698	21,111	155,193	110,927
Chucks for machine tools	897	1,514	7,413	13,006
Reamers, cutters, drills, taps, dies and other metal-working tools, pounds		190,020		943,960

Industrial Men in the Day's News

Dr. John Johnston Heads Research of United States Steel Corp.

LEAVING a career of pure scientific research where he has won national recognition, he assumes charge of a new department of the largest steel producing interest.

VARIED industrial experience has been capped by eight years with Yale university where he developed a prominent department of chemistry and chemical research.

ALTHOUGH born and educated in Scotland, he is not a golfer, turning to hiking and fishing for his recreation. He is fond of outdoor and rural life.

ON JULY 1 Dr. John Johnston takes up his duties as head of the new research department of the United States Steel Corp. He comes to the steel industry without any prejudices, a scientific man, thoroughly schooled in the fundamentals of research. His experience has been largely outside of the steel industry. The first few months in his new work will be spent visiting steel plants and studying metallurgical problems and practices. He then will take active charge of organizing an adequate research personnel and plant.

He was graduated as a bachelor of science from the University of St. Andrew's, Scotland, in 1903, since which time his experience forms an unusual record of achievement and of honors. By a singular coincidence he started his scientific career as the result of a Carnegie scholarship in chemistry awarded him in 1903. Now, after 24 years, he becomes associated with another organization based partially upon Mr. Carnegie. In 1905 he received a further scholarship which took him for two years to the University of Breslau, Germany, in association with Professor Abegg. He came to America in 1907 with the intention of staying only one year but, as he now says, he fell in love with the country and has not been able to leave since. For one year he was research associate in the laboratory of physical chemistry in the Massachusetts Institute of Technology, Cambridge, Mass., and then for eight years he served on the staff of the geophysical laboratory of the Carnegie institute at Washington. From 1916-18 he was in charge of the research department of the American Zinc, Lead & Smelting Co. During this time he was instrumental in effecting many economies in the production of zinc and its by-products as a result of chemistry of the metallurgical processes. He served one year, just at the close of the war, as secretary of the National Research Council during which time he was interested in many war activities, including gas investigation. In 1919 he was appointed Sterling professor at Yale university, New Haven, Conn., and shortly after became chairman of the department of chemistry, which position he has held since.

Before Dr. Johnston was called to Yale there were two chemistry departments, and one of his problems was to consolidate them without friction or loss of efficiency. Under his direction a great new building of unique design, admirably suited to chemical research and the study of chemistry was erected on the Yale campus. He is author or joint author of nearly 60 papers published in various scientific periodicals. These deal mainly with physico-chemical and geochemical problems. They include: Thermal Dissociation of Calcium Carbonate; Influence of Pressure on the Melting Points of Certain Metals; Mineral Sulphides of Iron; On the Density of Solid Substances with Especial Reference to Permanent Changes Produced by High Pressures; A Correlation of the Elastic Behavior of Metals with Certain of their Physical Constants; and On the Effect of High Pressures on the Physical and Chemical Behavior of Solid Substances.

His father was a farmer who lived near the small town of Perth, Scotland, and his earliest recollections are associated with sheep and cattle and Scottish farming activities. His leaning has been toward rural life since. His family which includes a daughter and two sons, is fond of

outdoor life and finds one of its greatest pleasures at a summer home near Bar Harbor, Me.

Although a Scotchman, Dr. Johnston is not a golfer. He is an enthusiastic walker, however, and is fond of fishing.

His honors in the scientific world, which have been many, include the degree of doctor of science from St. Andrew's university in 1908. His scholarship in chemistry was the first under the Carnegie trust for Scotch universities.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields of Enterprise

FRANK C. PAGE has been elected president of the E. W. Bliss Co., Brooklyn, N. Y., to succeed the late James W. Lane. Frank D. Mackay has been elected first vice president. Both Mr. Page and Mr. Mackay have been with the E. W. Bliss Co. since boyhood. Mr. Page for many years had occupied the post of first vice president and general manager, and Mr. Mackay had been second vice president.

* * *

George J. Robinson and George G. Raymond have been re-elected directors of the Todd Shipyards Corp., New York, for a four-year term.

* * *

Henry F. Moller, formerly with Texas Gulf Sulphur Co., has joined the engineering staff of Hartwell Iron Works, Houston, Tex., as assistant chief engineer.

* * *

Fred J. Fisher, president of the Fisher Body Co. and vice president of the General Motors Corp., Detroit, has been elected a director of the Michigan Bell Telephone Co., that city.

* * *

Edward J. Lavino, chairman of E. J. Lavino & Co., of Philadelphia, departed June 25 for England. He later will spend some time on the Continent, and is expected to return in September.

* * *

Robert H. Anderson, second vice president and superintendent, Keasbey & Mattison Co., Ambler, Pa., manufacturer of asbestos products, has been elected president of the Ambler Trust Co.

* * *

E. E. Norquist has been elected president and general manager of the Butler Mfg. Co., Kansas City, Mo., and Minneapolis, succeeding Charles R. Butler, who has been elected chairman. From the beginning of the company he served as plant manager. Later he became first vice president and plant manager.

* * *

William J. Nugent, president and general manager, Nugent Steel Castings Co., Chicago, was re-elected to the board of directors of the American Foundrymen's association at its recent meeting in Chicago. He has been connected with the foundry industry since 1902, when he became assistant to the president of the American Steel Foundries, Chicago. He was works manager, Sivyer Steel Castings Co., Milwaukee, for five years, after which time he became associated with the Electric Steel Co., Chicago, later the Nugent Steel Castings Co. Mr. Nugent has served on the board of directors of the Foundrymen's association since 1924.

WILLIAM J. NUGENT

* * *

F. A. Wade has resigned as purchasing agent of the Studebaker Corp., South Bend, Ind.

Arthur J. Chanter succeeds Mr. Wade, and will be located at South Bend instead of Detroit where Mr. Wade had made his headquarters.

* * *

M. T. Gossett, for the past few years with the United Iron Works Inc., Kansas City, Mo., as engineer and salesman at the Memphis, Tenn., office, has been appointed superintendent of the refrigerating department of the Nashville Machine & Supply Co., Nashville, Tenn.

* * *

E. A. Taylor has been appointed manager of the Yellow Sleeve Valve Engine Works Inc., East Moline, Ill., a subsidiary of General Motors Corp., at which plant the engines are being built for the Yellow Truck & Coach Mfg. Co. He has been with this company about four years.

* * *

M. Jack London, who has been manager of the Detroit office of the Pittsburgh Steel Products Co., Pittsburgh, has been transferred to Pittsburgh as district manager. He was associated formerly with the American Locomotive Co. in the automobile division at Providence, R. I. He has been with the Pittsburgh Steel Products Co. for about 15 years in various capacities.

Thomas F. Thornton will succeed Mr. London at Detroit. He was connected with the Detroit Steel Products Co. as purchasing agent for 13 years. Later he was president of the Roehm Steel Rolling Mills, Detroit, and then was manufacturers' agent handling automotive products.

* * *

E. Standfuss formerly works manager of Harnischfeger Corp., Milwaukee, builder of electric traveling cranes and excavating machinery has just been elected vice president. He received his engineering education in Saxony and after his schooling entered the employ of a large shipyard in Germany. He worked there for three years and was assistant works

manager when he came to America in 1906. Since then he has been connected in engineering capacities with United States Steel Corp., Marion Steam Shovel Co., Tampa Shipbuilding & Engineering Co., Emerson Steam Pump Co., and the Clyde Iron Works Co., Duluth. He was general superintendent of the Clyde company from 1912 until 1920 when he joined the Harnischfeger Corp. then the Pawling & Harnischfeger Co., as works manager.

* * *

E. J. Block, vice president, Inland Steel Co., Chicago, is taking a vacation on the Pacific coast. He will visit the Hawaiian islands.

* * *

Walter L. Malotte, vice president in charge of sales, Hannum Mfg. Co., Milwaukee, manufacturer of steering gears, has resigned.

* * *

Elmer C. Hawley has joined the advertising department of Armstrong Cork Co., Pittsburgh. He was formerly advertising manager of Insulite Co., Minneapolis.

* * *

Clarence M. Wooley, president of the American Radiator Co., has been awarded the decoration of officer of the crown of Belgium. The decoration was bestowed on June 23 by Baron de Cartier de Marchienne, former Belgian ambassador to Washington.

* * *

George W. Kennedy, who has been president of the Kelsey Wheel Co., Detroit, now is president of the Kelsey-Hayes Wheel Corp., formed by the merger of the Hayes Wheel Co., Jackson, Mich., and the Kelsey company. He will be located in the main offices at Detroit.

* * *

Walter H. J. Taylor has been appointed assistant professor of chemical engineering at Carnegie Institute of Technology, Pittsburgh. For four years he was affiliated with the research laboratory of the American Sheet & Tin Plate Co., Pittsburgh, and from 1916 until the present year was a professor of chemistry at St. Johns university, Shanghai, China.

* * *

George Crompton, president, Crompton Associates, Worcester, Mass., is a member of the board of directors of the Worcester County National Bank, formed recently through the merger of the Mechanics National Bank, Worcester, Mass., and the Fitchburg Bank & Trust Co., Fitchburg, Mass. Other members of the board include George E. Duffy, president and treasurer, George E. Duffy Co., Worcester; Albert J. Gifford, treasurer, Leland-Gifford Co., Worcester; C. S. Hardy, treasurer, William A. Hardy & Sons, Fitchburg; Norman Harrier, Linton Bros. & Co., Fitchburg; Aldus C. Higgins, treasurer, and George N. Jeppson, secretary and works manager, the Norton Co., Worcester.

* * *

Howard S. Hopkins, credit manager for Belcher & Loomis Hardware Co., has been elected president of the Rhode Island Association of Credit Men. Other officers include Albert A. Wainwright, Gorham Mfg. Co., first vice president; Henry C. Becker, Blanchard, Young & Co., treasurer; and Ralph S. Potter, Pawtucket Sash & Blind Co., secretary.

* * *

Charles F. Kettering, vice president, General Motors Corp., Detroit, has incorporated with George B. Smith and Lee Warren James, the Charles F. Kettering Foundation for the Advancement of Human Knowledge. The foundation will not employ any existing plan or institution, but will be used as an agency to organize other forces for the furtherance of science, art, literature and education.

* * *

M. L. Mozier, is the newly appointed sales manager of Hudson Valley Coke & Products Corp., Troy, N. Y. He originally started with the Erie railroad but soon went with the Perry Iron Co. at Erie, Pa. Later he became assistant to the president of the Replogle Steel Co. and general sales manager and then assistant to the president of Witherbee Sherman & Co., Port Henry, N. Y., which office he resigned recently. Mr. Moizer's headquarters will be at Troy, N. Y.

* * *

Bruno V. Nordberg, executive engineer of the Nordberg Mfg. Co., Milwaukee, has been appointed a member of the Milwaukee sewerage commission to succeed Robert Cramer, who has resigned in order to become chief engineer of the commission. Mr. Nordberg is a graduate of the University of Wisconsin college of engineering and is a son of Bruno Nordberg, founder of the Nordberg company.

* * *

W. L. Mellon, president of the Gulf Oil Co., has been elected a director of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., succeeding R. B. Mellon, president of the Mellon National bank, Pittsburgh, resigned. The following four directors whose terms have expired, were re-elected: James C. Bennett, comptroller, Westinghouse Electric & Mfg. Co.; Samuel M. Vauclain, president of the Baldwin Locomotive Works, Eddystone, Pa.; E. M. Herr, president, and L. A. Osborne, vice president of the Westinghouse company.

* * *

Gottfrid Olson, foundry superintendent of the Illinois Malleable Iron Co., Chicago, sailed for Stockholm, Sweden, June 21, to become plant manager of the Pump-Separator Co., Stockholm. He has been with the Illinois Malleable Iron Co. for the past ten years. Previously he was connected with the Chicago Hardware Foundry Co. and the Manitoba Bridge & Iron Co., Winnipeg, Man. Mr. Olson is a member of the American Foundrymen's association, the Swedish Engineers' society, and vice president Chicago Foundrymen's club.

* * *

Victor Everett Edwards, vice president, Morgan Construction Co., Worcester, Mass., received the honorary degree of doctor of engineering at Worcester Polytechnical institute, recently. He was graduated from the institute in 1883. Mr. Edwards is identified with the steel industry as an inventor of steel mill equipment.

William Lafayette Darling, graduate of 1877, who also received a degree by the institute, is a consulting engineer.

William Elgin Wickenden who also received a degree of doctor of engineering, is a graduate of the University of Wisconsin, and following a connection with the American Telephone & Telegraph Co., is now the director of investigation of the society for the promotion of engineering education, New York.

* * *

W. F. Graver has been elected president and treasurer of the Graver Corp., East Chicago, Ind., fabricator of steel tanks. He succeeds his brother J. P. Graver, who has been in charge of the business for a long time as president, and who remains as second vice president. W. F. Graver for many years has been vice president and treasurer.

P. S. Graver, third of the brothers, remains as vice president in charge of manufacturing and sales. H. S. Graver remains as secretary.

K. W. Bartlett, third vice president, has been with the company since 1910 and has held the position of general manager for several years. A. E. Lucius of Lucius, Buehler & Lucius, assistant secretary, has been legal representative of the company.

British Pig Iron More Active

Decline in Production Is Believed To Be Checked—Export Demand Broadening —Small Steel Bookings Do Not Favor Continuous Operations —Belgians Book South American Orders

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, June 28.—(By Radio)—Domestic and foreign demand for Middlesbrough pig iron is improving Scotch foundries are absorbing supplies in advance on their contracts with continental furnaces, following which larger consumption of domestic iron is expected. Further reduction in operations of British blast furnaces is not anticipated. Exports of hematite from the east coast to the continent gradually are improving.

Orders for steel are small and do not seem to favor continuous operations. The situation of the Sheffield specialties is satisfactory. The market for wire rods is suffering from competition from the continent. Operations at British tin plate mills average 60 per cent.

Berlin reports new business is quieter, but present bookings prevent mills from taking orders for immediate delivery. Hand-to-mouth buying is the rule in France. Belgian steelmakers have taken some fairly good orders for the Dutch colonies and South America.

British Iron and Steel Market Is Encouraged

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.

BIRMINGHAM, Eng., June 17.—(*European Staff Service*)—Though British iron and steel markets continue exceptionally dull, encouraging signs are to be found in the production figures for May and the returns of overseas trade.

The Middlesbrough iron trade shows a more hopeful tone and the recent fall in prices has practically stopped the purchase of Continental iron by local consumers. Large quantities of material, however, came in last month, foundry iron totaling 18,684 tons, compared with 20,916 tons the previous month. Scotland seems to be the only market in which Continental iron is competitive as Scotch makers have not fallen into line with the lowering of values declared in other markets for raw material. Consumers of Cleveland iron are buying small quantities and generally avoiding forward contracts, and although no decision has been reached, it may be necessary further to curtail output. East coast hematite makers carry heavy stocks and the market is inclined to weakness with mixed numbers at about £3 18s ($18.94) per ton, though for large quantities something less would be accepted. The arrival of a cargo of ferromanganese into the Tees from Norway has aroused a good deal of interest and offsets the shipments to America which took place last week. Fuel prices are unchanged but smelters are still hoping for cheaper furnace coke.

Sterling $4.86

Steelworks in the Middlesbrough district could handle more orders as the quantity of business passing covers a comparatively small tonnage. Mills are looking to shipyards for a revival of activity, but so far the demand from this quarter has been disappointing. Continental manufacturers are keen competitors in the Middlesbrough market and last week over 2000 tons of steel were landed on Teesside.

Poor demand for iron in the Furness district has led to the closing down of a furnace owned by the Whitehaven Iron & Steel Co. at Cleator Moor, thus leaving 14 furnaces in blast between Workington and Carnforth.

The outlook in South Wales is dis-

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, June 27	*British* Gross Tons U. K. Ports	£ s d	*French* Metric Tons Channel Ports	£ s d	*Belgium and Luxemburg* Metric Tons Channel Ports	£ s d	*German* Metric Tons Rotterdam or North Sea Port	£ s d
Export Prices f. o. b. Ship at Port of Dispatch—By Cable								
PIG IRON								
Foundry No. 3, Silicon 2.50-3.00	$17.01	3 10 0*	$14.58	3 0 0	$14.58	3 0 0	$17.62	3 12 6
Basic	23.33	4 16 0	16.04	3 6 0	16.04	3 6 0	17.86	3 13 6
Basic-bessemer	19.44	4 0 0†	14.82	3 1 0	14.82	3 1 0	17.25	3 11 0
Hematite, Phosphorus 0.02-0.05	18.95	3 18 0	22.93	585*	.....	.....	17.25	3 11 0
SEMIFINISHED STEEL								
Billets	$32.81	6 15 0	$21.14	4 7 0	$21.14	4 7 0	$21.14	4 7 0
Wire rods	46.17	9 10 0	27.34	5 12 6	27.34	5 12 6	27.34	5 12 6
FINISHED STEEL								
Standard rails	$36.67	7 15 0	$30.38	6 5 0	$30.38	6 5 0	$30.38	6 5 0
Merchant bars	1.57c	7 5 0	1.02c	4 13 0	1.02c	4 13 0	1.07c	4 17 0
Structural shapes	1.44c	6 12 6	1.01c	4 12 0	1.01c	4 12 0	1.03c	4 14 0
Plates, ship, bridge and tank	1.68c	7 15 0	1.32c	6 0 0	1.32c	6 0 0	1.32c	6 0 0
Sheets, black, 24 gage	2.39c	11 0 0	2.17c	9 17 6	2.17c	9 17 6	2.86c	13 0 0
Sheets, galvanized, 24 gage, corrugated	3.15c	14 10 0	3.19c	14 10 0	3.90c	3,000*	3.74c	17 0 0
Bands and strips	2.28c	10 10 0	1.28c	5 16 0	1.28c	5 16 0	1.49c	6 15 0
Plain wire, base	2.12c	9 15 0	1.57c	7 2 6	1.57c	7 2 6	1.60c	7 5 0
Galvanized wire, base	3.04c	14 0 0	2.04c	9 5 0	2.04c	9 5 0	2.09c	9 10 0
Wire nails, base	2.50c	11 10 0	1.73c	7 17 6	1.73c	7 17 6	1.76c	8 0 0
Tin plate, base box 108 pounds	$ 4.62	0 19 0	.....	.....	.....	.....	$ 6.80	1 8 0

*Francs

Domestic Prices at Works or Furnace—Last Reported			Francs		Francs		Marks	
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$17.01	3 10 0	$18.03	460(2)	$17.79	640	$19.78	86
Basic pig iron	23.33	4 16 0	19.40	495(1)	17.79	640	20.24	88
Furnace coke	5.22	1 1 6	7.06	180	5.14	185	4.95	21.50
Billets	32.81	6 15 0	20.78	530	21.96	790	25.88	112.50
Standard rails	1.74c	8 0 0	1.51c	840	1.30c	1,000	1.46c	140
Merchant bars	1.74c	8 0 0	1.10c	610	1.16c	890	1.40c	134
Shapes	1.65c	7 12 6	1.04c	575	1.14c	880	1.37c	131
Plates, ship, bridge and tank	1.82c	8 7 6	1.33c	740	1.46c	1,125	1.55c	149
Sheets, black, 24 gage	2.50c	11 10 0	2.52c	1,400	2.28c	1,750	2.29c	220
Sheets, galvanized 24 gage, corrugated	3.17c	14 12 6	3.60c	2,000	4.23c	3,250	3.65c	350
Plain wire	2.12c	9 15 0	2.52c	1,400	2.15c	1,650	2.03c	195
Bands and Strips	2.28c	10 10 0	1.33c	740	1.20c	925	1.61c	154

*Middlesbrough; †Scotch foundry iron: (1) Basic-bessemer; (2) Longway. British export furnace coke £1 0s 0d ($4.86) f. o. b. Ferromanganese £19 12s 0d ($95.26) delivered Atlantic seaboard, duty paid. German ferromanganese £15 0s 0d ($72.90) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

turbing owing to the severe depression in the steel and tinplate industry. It is estimated that only about 60 per cent of the men are employed. Some tin plate and steelworks are completely idle and others have only half their plant at work. Baldwins steelworks at Llandore, which have been idle for the past three months, are to close down indefinitely and consequently scrap iron in the yard is being transferred to other works of the company. Some of the works have definitely stated that they will not re-open till plates can be sold on a remunerative basis. The result of the closing down of mills has brought about a little firmness in values and the general quotation for tin plate would be about 19s ($4.62). Some buyers are bidding at 18s 9d ($4.56) and probably one or two deals have been closed on this basis. Makers of tin plate bars are maintaining the price at £6 5s ($30.37) although foreign material is largely used and can be bought at £1 ($4.86) less. Tin plate exports are unusually healthy, the May total of 50,937 tons being the highest declared since March 1926.

Galvanized sheet values vary between £14 10s ($70.47) up to £15 ($72.90) according to the state of makers' order books. The largest overseas buyer in May was India taking 28,365 tons out of a total of 74,165 tons exported to various parts of the world.

French Steel Market Lacks Profit

Office of IRON TRADE REVIEW,
9 Rue de Londres

PARIS, June 17.—(*European Staff Service*)—Following the improvement of the international market which was effected on the Brussels bourse at the end of May, French iron and steel makers have received a number of orders, but this activity already has subsided at the same time as the Brussels market has resumed a dull aspect. This situation is beginning to cause anxiety to the French iron and steel industry, particularly to concerns which produce large tonnages of rolled products, plates, sheets and merchant bars. Plants which concentrate on specialized products are not so much affected. There is not much prospect of renewal of activities in the building trade owing to the uncertainty of the future and the heavy taxation, which factors do not favor large building schemes.

The darkest spot is that the French iron and steel trade now is being conducted at a loss, and this state of affairs cannot continue indefinitely.

Franc—3.91c

It is felt that the first remedy is to bring down production costs, and in view of the fact that the price of coal is an important factor in steelmaking, producers are actively negotiating with collieries to obtain a lower price of coal. It is also beginning to be felt that production should be reduced, and finally it is hoped that selling syndicates will be formed which will limit competition and put an end to continually decreasing prices. For the time being it is hoped that the meeting of the council of the international steel entente in Luxemburg will bring satisfactory results and that the wire rod syndicate will be definitely formed.

The government has met the requests of the iron and steel industries by exempting coke and coking fuel from import licenses on foreign coal which now are being enforced. It is pointed out that the price of coke now is seven times, while the price of steel is only four times, the pre-war price. There is a current demand for foundry pig iron, but consumers are taking care of only their immediate requirements. Inquiries for hematite pig iron are scarce. British hematite pig iron is offered on the Atlantic coast below domestic prices. Semifinished steel is dull. Basic bessemer blooms are 485 francs ($18.95) per metric ton, billets 520 francs ($20.35), structural steel 570 francs ($22.25), beams from 550 to 560 francs ($21.50 to $21.85) and merchant bars 590 francs ($23.10). Plates and sheets are easy; 2-millimeter sheets are quoted at from 950 to 1000 francs ($37.10 to $39).

Demand for wire rod is small, and the difference between the price of wire nails, which is 1100 frances ($43), and that of wire rod, which is 750 francs ($29.30), does not leave much profit to nail manufacturers. The export price of wire rods is fixed at £5 7s ($26) per ton f. o. b. Antwerp for orders of 1000 tons and over and £5 10s ($26.60) for smaller.

German Export Tonnage Is Gaining

BERLIN, June 17. — (*European Staff Service*). — Export sales, which were considerably reduced a few weeks ago, have slightly increased, owing to the better prices available. Merchant bars now are quoted at £4 17s ($23.50), but this price is not attractive to German steelmakers. Some orders from abroad have been booked for ship plates, but foreign shipments of pipe are at about the same figure as in previous months. American orders for oil pipe have decreased. The export price of £5 5s ($25.45) which until recently was quoted for wire rods was scarcely profitable to German makers, so that foreign sales of this product were limited and continued to decline from 15,762 metric tons in March to 14,761 tons in April. Exports of most products in April were considerably reduced, compared with previous months, while imports were greater than in any month since last year, as is shown by the following table, in metric tons:

1927	Imports	Exports
Jan.	188,217	514,961
Feb.	195,632	387,302
March	156,169	419,947
April	232,715	272,688
Jan. to April, 1927	772,732	1,692,641
Jan. to April, 1926	289,901	1,684,643

Exports of semifinished steel decreased from 28,610 metric tons in March to 24,484 tons in April, and shipments of bars and structural shapes from 60,411 tons to 56,319 tons. The greatest loss is in plates, exports of which were reduced from 42,487 tons to 29,855 tons as a result of smaller shipments to Holland and the United Kingdom. The most interesting feature was the heavy increase of imports which was particularly due to the fact that arrivals of scrap advanced from 20,123 tons to 25,886 tons, pig iron from 12,332 tons to 21,299 tons and bars and structural shapes from 44,726 tons to 61,340 tons. This latter increase mainly resulted from larger tonnages coming from the Saar district.

The works are busy with domestic orders and unfilled orders of most producers are sufficient to keep them going for 8 to 10 weeks. The Gelsenkirchen company has proposed a dividend of 4 per cent on the last financial period of six months. The financial position of most other companies also is satisfactory. Conditions in the coal market are not so bright. Buying of all kinds of steel for building purposes continues active, but this market is handicapped by the fact that sufficient money is not available for executing the big building schemes provided for during the present year. Unfilled orders for plates cover a period of about three months. The Phoenix plate rolling mill has been shut down in accordance with the rationalization scheme of the United Steel Works Co. The new bridge across the Rhine in Dusseldorf will be constructed by the United Steel Works in the Philipp Holzman Co., which also is participating in the erection of a new bridge in Cologne. The market for thin sheets has slightly revived and sales of pipe are increasing. Demand for heavy rails is good, large orders having been received from the railroads. Consumption of pig iron remains unchanged. Most of the minette iron ore needed for 1928 has already been covered by contracts.

Report Employment at 81 Per Cent of Capacity

New York, June 28.—Forecasting the business and employment outlook for the coming summer, a survey just completed by the National Association of Manufacturers shows industries of the nation are now operating and will continue to operate for the next three months, on the remarkably high basis of more than 81 per cent of their maximum employment capacity.

Nineteen per cent of these plants are now running at their full employment capacity, and 29 per cent are operating with 90 per cent of their maximum forces. Translating this into terms of normal good business, it is estimated that 90 per cent of the plants are to-day on a substantial employment basis and operating on a high production scale.

The association sent questionnaires to 3,000 members in pivotal sections, from the Atlantic to the Pacific. The questionnaire went to companies with payrolls ranging from as small as a dozen hands to companies with 40,000 employes. Replies were received from 2203 companies, and these reported that the number of employes required in their plants to maintain maximum capacity, was 1,509,920, an average of 685 per company; and that they now have under employment 1,227,325 or an average of 557 per company. This survey encompasses all industry and even includes many seasonal industries that are now at their lowest production scale. As compared with employment at the same time last year, this shows an actual falling off of less than 3 per cent.

Bethlehem Gets Cutters for Coast Guard

Washington, June 28.—Bethlehem Shipbuilding Corp. has been awarded the contract by the United States coast guard for five 250-foot cutters at $634,500 each, bids for which were received June 21. About 3000 tons of steel will be required.

Foundry Equipment Sales Rise in May

Cleveland, June 28.—Foundry equipment sales in May increased in value to $493,801, from $478,273 in April, according to reports of 18 members of the Foundry Equipment Manufacturers' association. Shipments dropped in May to $503,747, from $601,808 in April, while unfilled orders registered a 16 per cent decline from May 1 to June 1. Further comparisons follow:

1925	Sales	Shipments	Unfilled orders
Total	$4,665,300	$4,362,794	.....
1926			
Tot. (5 mos.)	$2,645,220	$2,525,060	.....
June	434,511	422,467	546,722
July	354,593	467,605	536,395
Aug.	403,608	396,293	424,206
Sept.	355,339	345,025	421,718
Oct.	410,248	343,593	367,579
Nov.	359,936	331,345	419,888
Dec.	582,896	458,040	445,608
Total, 1926	$5,255,352	$5,068,652	.....
1927			
January	$ 659,417	$ 373,229	$ 683,956
February	684,836	484,699	945,505
March	508,531	603,735	1,086,310
April	478,273	601,808	995,075
May	493,801	503,747	838,752
June 1	.....	.....	705,909
Tot. (5 mos.)	$2,824,858	$2,567,218	.....

Steel Castings Output On Steady Decline

Washington, June 28.—Production of steel castings continued to decline in May with the total of 81,671 tons compared with 90,498 tons in April and 97,868 tons in May, 1926, the highest mark for 12 months, reports from the department of commerce show. Bookings also declined from 78,282 tons in April to 66,425 tons in May. Bookings were at 50 per cent of capacity in May, a drop from 59 per cent in April. Output declined from 68 per cent of capacity in April to 61 per cent in May. Further monthly comparisons follow:

BOOKINGS

1926	Net tons	Per cent of capacity	Railway specialties net tons	*Miscellaneous castings net tons
May	80,800	61	31,388	49,412
Total 5 mos.	482,493	73	198,148	284,345
June	69,835	53	16,018	53,817
July	76,276	58	29,266	47,010
Aug.	68,127	51	22,998	45,129
Sept.	67,363	51	22,031	45,332
Oct.	74,680	56	27,827	46,853
Nov.	71,124	54	28,079	43,045
Dec.	86,006	65	38,111	47,895
Total, 12 mos.	995,904	63	382,478	613,426
1927				
Jan.	101,708	76	48,717	52,991
Feb.	91,707	69	39,792	51,915
March	82,488	62	31,380	51,108
April	78,282	59	31,004	47,278
May	66,425	50	24,848	41,577
Total 5 mos.	420,610	63	175,741	244,869

PRODUCTION

1926				
May	97,868	74	42,425	55,443
Total 5 mos.	503,144	76	210,519	292,625
June	95,323	72	34,421	60,902
July	87,040	66	30,694	56,346
Aug.	81,422	61	26,088	55,334
Sept.	79,471	60	22,837	56,634
Oct.	79,804	60	25,737	54,067
Nov.	86,569	65	24,421	62,148
Dec.	82,034	62	28,699	53,335
Total 12 mos.	1,094,807	69	403,416	691,391
1927				
Jan.	84,616	64	32,982	51,634
Feb.	85,383	64	33,250	52,133
March	97,256	73	38,784	58,472
April	90,498	68	36,693	53,805
May	81,671	61	32,043	49,628
Total 5 mos.	439,424	66	173,752	265,672

Bethlehem Accidents Cut 60 Per Cent

Accident prevention work of the Bethlehem Steel Corp. has reduced the number of accidents almost 60 per cent since the corporation first undertook safety and first aid education of its employes 11 years ago. This announcement was made in connection with the corporation's annual first aid and mine rescue meeting at Bethlehem, Pa., June 25.

Employes from all the steel plants and mines of the corporation competed for prizes amounting to $2000. Awards were made on the basis of efficiency in the administration of first aid and in mine rescue work.

May Be Long Deciding Fluorspar Dumping

Washington, June 28.—In connection with the request for information from its foreign agents dealing with the alleged dumping of fluorspar on the American market, the customs division, treasury department, has received a report from Italy. It is understood the report is not satisfactory. Reports are still pending from several other countries and indications are it will be some time before the government will be able to judge whether there is any dumping of this commodity on the American market.

Babbitt Consumption Up

Washington, June 28.—Apparent total consumption of babbitt metal in May rose to 4,619,588 pounds, compared with 4,169,277 pounds in April and 4,797,038 pounds in May, 1926, according to reports of 27 firms to the department of commerce. Sales by manufacturers increased to 3,648,987 pounds, in May, from 3,219,237 pounds in April. Further monthly comparisons follow:

1925	*Total apparent consumption	*Sales by manufacturers	*Consumption by producers
Totals	62,405,928	48,279,803	14,126,125
May	4,797,038	3,640,369	1,156,669
1926			
Total (5 mos.)	26,179,426	19,886,520	6,292,906
June	4,963,975	3,633,211	1,380,284
July	5,015,464	3,676,664	1,338,800
August	4,986,825	3,632,920	1,353,905
September	5,337,032	3,854,702	1,482,330
October	4,868,053	3,529,081	1,338,972
November	4,358,127	3,211,227	1,146,900
December	4,012,677	2,917,102	1,095,575
Total (1926)	59,721,579	44,341,907	15,379,672
1927			
January	4,975,552	3,755,861	1,219,691
February	4,574,931	3,508,682	1,066,249
March	5,157,600	3,949,609	1,207,991
April	4,169,277	3,219,237	950,040
May	4,619,588	3,648,987	970,601
Total (5 mos.)	23,496,948	18,082,376	5,414,572

*Figures given in pounds.

Obituaries

CHARLES W. BRYAN, 65, chief engineer of the American Bridge Co., Pittsburgh, died June 25 at his home in New Rochelle, N. Y. He was a native of Washington, Mo., and was graduated with high honors as a civil engineer in 1884 from Washington university, St. Louis, and later received the honorary degree of master of arts in recognition of contributions to the science of bridge building. He was associated for a short while with C. Shaler Smith, St. Louis, going from there to the Edge Moor Iron Co., Wilmington, Del. Later he became engineer of bridges for the Missouri Pacific, to return in 1888 to the Edge Moor Iron Co., as engineer. When the Edge Moor Bridge Works was organized in that year as a separate unit he became affiliated, and was chief engineer at the time the company was absorbed by the newly organized American Bridge Co. In 1911 he was made chief engineer of the Bridge Company.

* * *

Enoch Peterson, president, William D. Gibson Co., Chicago, manufacturer of springs, died recently.

* * *

P. A. Peterson, president, Rockford Drop Forge Co., Rockford, Ill., died June 9.

* * *

William Henry Vick, vice president, Oklahoma City Hardware Co., Oklahoma City, Okla., died recently.

* * *

Reuben E. Butrick, counsel and office manager of the Kerite Insulated Wire & Cable Co., New York, died June 22 at his home in Brooklyn, N. Y., aged 57.

* * *

Robert A. Keasbey, 70, president and general manager of the Robert A. Keasbey Co., New York, dealer in asbestos materials, died June 22 at his home in Roseland, N. J.

* * *

John McEncroe, 94, railroad contractor, died at his home in Schenectady, N. Y., recently. He did considerable work for the New York Central.

* * *

Percival M. Vilas, 57, northwest manager of the Youngstown Sheet & Tube Co., Youngstown, O., died recently in Minneapolis. Mr. Vilas was born in Madison, Wis., and went to Minneapolis 33 years ago. For many years he had been district manager of the Sheet & Tube company, with offices in the Andrus building.

* * *

Bradford McIntyre, 47, who died recently at Miami, Fla., while there on business, since June, 1925, had been southeastern representative of the Pittsburgh Screw & Bolt Corp., Pittsburgh.

* * *

Julius Schuengel, 46, general superintendent, Geuder, Paeschke & Frey Co., Milwaukee, manufacturer of metal stampings and enameled ware, died June 22. He was a native of Milwaukee. He entered the Geuder plant when 16 years old and was made general superintendent in 1917.

* * *

Edward H. Darby, in charge of the chemical laboratory and research department Rome Wire Co., Rome, N. Y., died at his home there recently. He was a graduate of Clark university, Worcester, Mass., and a member of many scientific and chemical societies.

* * *

William H. Thornley, 85, whose inventions connected him with the steel industry, died recently at his home in Reading, Pa. He was at one time connected with the Sternbergh Bolt & Nut Works, Reading, and for several years was associated with the National Bolt & Nut Works, North Reading.

* * *

James W. Brown, 62, vice president, Western Machine Co., Milwaukee, manufacturer of special machinery, died June 19. He was born in Grand Rapids, Mich., and settled in Milwaukee in 1896. Mr. Brown was identified with the Chain Belt Co. for a quarter of a century prior to participating in the organization of the Western company.

* * *

John Milton Goodell, associate editor of *Engineering News* and a former editor of the *Engineering Record*, died June 21 at the French hospital, New York. He was born at Worcester, Mass., in 1867 and was graduated from the Worcester Polytechnic institute in 1888. For a time he was assistant secretary of the American Society of Civil Engineers. He retired in 1912, and since then had spent much time in writing and was the author of several books. Mr. Goodell was employment manager for the Emergency Fleet Corp. during the war and later served as acting chairman of the National Highway council and in charge of materials, transportation, and labor for road work. Next he acted as consulting engineer to the bureau of public roads, and in recent years had been editor of the *Journal* of the American Waterworks association and had spent considerable time in connection with the advertising and publicity for the Babcock & Wilcox Co., New York.

* * *

Walter Nathan Crafts, 55, works manager, Reading Steel Casting Co., Reading, Pa., died recently. He had been superintendent of the Sharon, Pa., plant of the American Steel Foundries, Chicago, manager and part owner of the Crucible Steel Forge Co., Cleveland, president and general manager Canadian Electric Steel Ltd., Montreal, Que. He was a graduate of Oberlin college Oberlin, O. in 1892, and Massachusetts Institute of Technology Boston, in 1895.

* * *

Charles Frederic Rand, 70, distinguished mining engineer, died at his home in West Orange, N. J., June 21. Mr. Rand, whose headquarters were at 71 Broadway, New York, discovered iron ore deposits on the north coast of Cuba, and built the Barraco railroad there. He owned and operated iron mines in the Lake Superior district, was president of the North American Exploration Co., president of the Moa Bay Iron Co. and officer and director of many subsidiary companies of this company, and president of the Antimony Corp. of New York. He was interested also in manganese ore. In 1913 he was decorated by King Alfonso XIII of Spain with the Grand Cross of Knight Commander of the Order of Isabella Catolica. In 1922 he was decorated with the Croix de Chevalier de la Legion d'Honneur of the French government for distinguished service during the World war, and he was elected an honorary member of the Iron and Steel institute of Great Britain. Mr. Rand was former president of the American Institute of Mining and Metallurgical Engineers. He was former chairman of the executive board of the Engineering Foundation.

Machinery

Several Inquiry Lists Appear but Most Activity Continues in Small Lots—Westinghouse List Unusually Light

MACHINE tool and equipment activity of the past week included the bringing out of inquiries for several lists. Most negotiations are for single items, however. Expected purchases of John Deere & Co. feature the Chicago market, while New York market interest centers on the placing of 25 machines by the Bartlett-Hayward Co., Baltimore. Railroad activity is confined largely to single tool purchases, although the Santa Fe is buying against a list.

Westinghouse Electric & Mfg. Co. has issued its third quarter list, about the smallest it has produced, a few single items being sought. Buying of cranes was more pronounced in the past week, Mississippi Valley Structural Steel Co. leading the market with 15 awarded.

New York, June 28.—Machine tool activity is featured by the placing of orders against the list of about 25 machines issued by the Bartlett-Hayward Co., Baltimore, for the Brooklyn Union Gas Co., Brooklyn. It is expected that the purchases will be completed within the next week to 10 days. Early action is expected also on the list of 15 machines for the new shop for the College of Physicians and Surgeons, this city.

Recent purchases include a 90-inch locomotive axle journal turning lathe for the New York Central, an axle lathe for the Atchison, Topeka & Santa Fe, and 42-inch by 24-foot heavy lathe for the Northern Pacific, all going to Niles-Bement-Pond Co., which also booked a 48-inch car wheel borer for the Illinois Car & Mfg. Co. Pratt & Whitney Co. booked a 6-inch vertical shaper, a 16 by 60-inch lathe and two 1 by 18-inch automatic lathes for an electrical company in Indiana; also a universal bench hand drilling machine for the war department, a 7 by 32-inch bench lathe for a boiler manufacturing company in New Jersey, two 13 by 30-inch lathes for an electrical manufacturing company in Massachusetts, a jig borer for a machine tool company in Michigan and a 13 by 30-inch lathe for a high school in Milwaukee.

Figures just issued by the Electric Hoist Manufacturers' association New York, for May, showed an increase in the number of hoists sold by its members of 16.197 per cent, as compared with April, and in the value, 23.3114 per cent. Shipments in that month fell off 9.9494.

Chicago, June 28.—Purchase by John Deere & Co. of a number of machine tools as a part of its program of machinery equipment for its plants at East Moline, Ill., and Waterloo, Iowa, was one of the important features of the market during the week. The Deere company is expected to buy in total about $200,000 worth of tools. Railroad buying is light, but the Santa Fe is expected to purchase further against its list shortly and Chicago & North Western likely will place some equipment. Chicago, Milwaukee & St. Paul is asking bids on a few items. The Rockcastle Engineering Co., Chicago, has purchased about ten tools for its new general machine and repair business. Mississippi Valley Structural Steel Co. soon will be in the market for punching and shearing equipment. A Kansas City buyer has purchased a 21-inch lathe and double-end punch and shear.

Pittsburgh, June 28.—Equipment buyers in this territory apparently are adopting various retrenchment measures. They are not buying equipment they can do without, and even ordering of repairs is not normal. Some repair part inquiries in cranes, for instance, involving expenditures of $25 to $2500 each, are allowed to drag. Some have been contemplated since December. Machine tool market activity consists of single orders now and then, although the Pittsburgh Motor Coach Co. is understood to have purchased some small machines.

CRANE ORDERS PLACED

Fifteen cranes, two 5-ton and three 3-ton motor-driven underhung cranes; four 2-ton motor-driven underhung cranes with double hoist and triple end trucks; two 3-ton motor-driven cranes with triple end trucks and single hoists; and three 2-ton hand-geared underhung cranes; 2-ton motor-driven underhung crane with single hoist and triple end trucks, for Mississippi Valley Structural Steel Co., Decatur, Ill., for its new Melrose Park, Ill., plant, to H. D. Conkey & Co.

Three 10-ton electric cranes for the Lehigh Valley railroad, placed, the order reported going to Whiting Corp.

Two bucket handling cranes, one of three yards capacity, with a 100-foot span, and the other two and a half yards capacity, with 60-foot span, placed for Lawrence Cement Co., Northampton, Pa., for installation at Thomaston, Me., the contract reported going to Harnischfeger Corp.

Among single awards were: 10-ton crane for Southern International Paper Co., Camden, Ark., to H. D. Conkey & Co.; 5-ton handpower crane, 20-foot span, for Atlas-Chicago Co., to H. D. Conkey & Co.; 10-ton gantry crane for Wisconsin Steel Co., to Alliance Machine Co.; 5-ton handpower crane, 39-foot span, for Clove pumping station, New York, to New Jersey Foundry & Machine Co.; 10-ton handpower crane, for Carrier Engineering Corp., Newark, N. J., to New Jersey Foundry & Machine Co.; 25-ton locomotive crane for Central Iowa Power Electric Co., Waterloo, Ia., awarded through United Gas Improvement Corp., Philadelphia, to American Hoist & Derrick Co.; 25-ton used locomotive crane for French Creek Granite Co., St. Petersburg, Pa., to Philip T. King; this proposition was erroneously reported last week as pending and involving a large number of cranes.

CRANE ORDERS PENDING

Three 25-ton locomotive cranes for Amtorg Trading Corp., New York. Action expected at once; as previously noted, the Amtorg corporation recently closed on three 40-ton locomotive cranes to Industrial Works.

Among single inquiries were: 5-ton used overhead crane, 60-foot span, for Watkins Structural Steel Co., Brooklyn, N. Y.; bids asked.

Westinghouse Electric & Mfg. Co. has issued its third quarter list, believed to be the smallest it ever has put out, involving only a few items, one machine each, such as a lathe, milling machine, drill press, etc. New crane inquiries and sales are lacking.

Worcester, Mass., June 28.—Machine tool buying continues spotty with the aggregate business generally considered satisfactory for the expected seasonal recession which in several plants is yet to materialize. Fair inquiry came from automobile interests during the week. Several grinders have been sold. A borer of large size went to a Connecticut interest. Bench tool business is fair. Textile machinery makers are more optimistic with fair business developing outside New England and a better inquiry and outlook in that section. Railroads are buying bench tools in limited volume.

Boston, June 28.—The machinery trade is experiencing a slackening and although partly seasonal the lack of inquiries is discouraging. One or two small shipments have been made by local plants to midwest destinations but the market shows little life among dealers or manufacturers.

Cleveland, June 28.—Machine tool and equipment sales in June will fall behind May and consideraby under June 1926, according to several local sellers. Sales in the past week were confined to small lot transactions, one large distributor claiming not to have received an order for more than one tool at a time. Inquiries are scarce, many of the present requests for quotations being for estimating purposes. Little railroad activity is noted and practically no automotive inquiries or orders.

Used equipment buying fell off in the past week, although buyers continue to shop around in good number. Price competition continues on standard makes of used tools.

$115 Air Postage on Gear Ends $500 Daily Loss

Something was "out of gear" at a Plainville, Conn., plant last week. It was a gear on an electric shovel. Lack of a gear which had broken was costing the company $500 a day on a large contract. The second day a new gear arrived by air mail from Marion, O., and the break was repaired. It cost $115 to mail the gear, plus 20 cents worth of stamps for special delivery.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

PROPERTY of the Clinton Iron & Steel Co., Pittsburgh, has been purchased by the New York Central railroad for its subsidiary, the Pittsburgh & Lake Erie railroad. Announcement to this effect has been made by I. N. Lewis of L. J. Phillips & Co., New York, who had been negotiating the transaction for some months with Frank N. Hoffstot, president of the Clinton Iron & Steel Co. The property covers 500,000 square feet immediately adjoining the Pittsburgh & Lake Erie passenger terminal. At the New York Central offices the purchase was confirmed.

The Clinton Iron & Steel Co. plant comprises a merchant blast furnace and auxiliary equipment. The site is to be used in the development of the passenger terminal.

* * *

AMTORG TRADING CORP., 165 Broadway, New York, has placed orders for machinery and equipment involving an expenditure of about $1,000,000 in the United States, for shipment to Russia. They include sewing machines, cloth cutting machines and other apparatus, valued at $220,000, for clothing factories in Moscow, Leningrad and other Ukrainian cities. Gas meters, regulators and other equipment, valued altogether at $250,000, for utilizing natural gas in Grozny and Baku; equipment valued at $250,000 for a large refrigerator plant at the Black sea port of Novorossisk; crushers and other equipment valued at $35,000, for a talc grinding plant in the Urals; coal cutters, loaders, conveyors and other equipment for the Kuznetz coal fields in Siberia and for the coal fields of the Donetz basin; several 40-ton cranes, steam shovels and locomotives, and 25 air dump cars for construction work in connection with the 650,000 horsepower hydro-electric plant project on the Dneiper river.

* * *

LUKENS STEEL CO. just has rolled on its 206-inch mill at Coatesville, Pa., the largest plate in its history, and this is believed to be the largest plate ever rolled anywhere. It was rolled 3¾ inches thick, 74½ inches wide and 36 feet 11½ inches long. It later was finished to a thickness of 3½ inches. The plate was rolled for a machinery manufacturer.

* * *

DIXIE PIPE LINE CO., recently organized in New York, has bought a half interest in the Reserve Natural Gas Co. of Louisiana and announcement is made that a 22-inch pipe-line will be laid from northwestern Louisiana to the Texas gulf coast. It will supply Houston, Port Arthur and other industrial cities with gas for manufacturing purposes. O. R. Seagraves, Houston, Texas., is president and W. L. Moody, Galveston, Tex., is a heavy stockholder.

* * *

VULCAN IRON WORKS, Wilkesbarre, Pa., has re-elected officers as follows: President and general manager, Samuel T. Nicholson; vice president, George Nicholson; secretary and manager of purchases, Fred O. Smith, treasurer, William E. Willingale. Directors include William H. Conyngham, George M. Wall, Charles P. Hunt, Richard Sharpe, Isaac M. Thomas, George Nicholson, K. M. Smith, Walter E. Lewis, Samuel T. Nicholson, E. S. VanHorn and Fred O. Smith.

* * *

FUEL EFFICIENCY ENGINEERING CORP. has been incorporated at Birmingham, Ala., with $100,000 capital to manufacture and install powdered coal equipment in the South. Hardie-Tynes Mfg. Co., Birmingham, is manufacturing the first machines. James W. Whatley is president, W. W. Pettibone vice president and chief engineer, Samuel S. Williams secretary, treasurer and combustion engineer and B. L. Whatley, Denver, attorney. James W. Whatley has been engaged in coal selling for 21 years with the Tennessee Coal, Iron & Railroad Co., Debardeleben Coal Corp. and other companies. W. W. Pettibone has been engaged at Erie, Pa., in the building of coal-burning equipment.

* * *

HARDING BOILER CO., Fifty-fourth avenue and Eighteenth street, Chicago, recently incorporated, will produce house-heating boilers with built-in oil and gas burners. Manufacturing will be done by contract in outside shops. Samuel B. Harding is president and secretary, Henry L. Venn, vice president, and Charles J. Venn, treasurer.

* * *

AMERICAN ROAD MACHINERY CO. INC., is moving all manufacturing from Groton, N. Y., to Kennett Square, Pa., where a new building is being erected to house the additions. The old plant at Groton, N. Y., including some equipment, was recently offered to the highest bidder by Samuel S. Ellis, Philadelphia, auctioneer.

* * *

ROCKCASTLE ENGINEERING CO., 7011 Fulton street, Chicago, has organized to open a general machine and repair business at that location. Equipment already has been purchased by the new concern. The president of the company, U. J. Rockcastle, formerly was with the Hydraulic Engineering Co., Chicago.

* * *

KELSEY-HAYES WHEEL CORP., with main offices at Detroit, has formed following the merger of the Kelsey Wheel Co., Detroit, and the Hayes Wheel Co., Jackson, Mich. George W. Kennedy, who has been president of the Kelsey company, is president of the new corporation.

* * *

STUDEBAKER CORP. has transferred its purchasing department from Detroit to South Bend, Ind. Arthur J. Chanter is now purchasing agent.

Thomas Stack To Resume After Improvements

Resumption of operation of the former Thomas blast furnace at Milwaukee by the newly-organized Milwaukee Blast Furnace Co. is planned within a short time after improvements are completed, according to David W. Bloodgood, secretary of the bondholders' protective committee, which recently bid in the property for $300,000. The new corporation has a nominal capital of 500 common shares without par value, for the present. The Thomas company had a capitalization of $1,500,000.

Volume of Dollar Highest in Several Years

New York, June 28.—The purchasing value of the dollar as measured by living costs for the American wage earner and other persons of moderate means, which includes the great majority of the population, today stands higher than it has for more than two years past, according to the National Industrial Conference board. The dollar is now worth, on the basis of present living costs, 61.1 cents compared with the 1914 dollar. It was lowest in July, 1920, when it stood at 48.9 cents.

The purchasing power of the dollar has been thus enhanced by the steady decline in average living costs throughout 1925 and 1926, which last April, however, were still 63.7 per cent higher than they had been in 1914, just before the war. But the average weekly earnings of industrial workers, owing to higher way rates and more steady employment, at present are more than twice as high as they were in 1914, so that in spite of the higher living cost, the wage earner on the average draws weekly pay of about 34 per cent greater purchasing power than he did just before the war.

Amtorg Trading Corp. Is in Fourth Year

New York, June 28.—The Amtorg Trading Corp., 165 Broadway, New York, the principal organization in American-Soviet trade, is celebrating completion of its third year of operations. During the period the trade turnover of the organization has been close to $100,000,000, of which upward of $65,000,000, is represented by exports from the United States to the Soviet Union. The exports include agricultural machinery and supplies (including 27,000 tractors) valued at $16,137,984, industrial machinery and equipment valued at $16,912,123, automotive equipment at $2,752,284, raw materials (chiefly nonferrous metals) at $5,131,406, semimanufactured goods at $921,478 and staple consumption goods at $23,422,040.

Develops New Mill Drive

Chain drives are being substituted for gear drives on all cold strip mills operated by the Elliott-Blair Steel Co. at its New Castle and Mercer, Pa., plants. The chain and sprocket method was developed and recently patented by Noah W. Elliott, president, and is claimed to eliminate any roll backlash which otherwise leaves the surface of the strip wavy. A 4-stand tandem mill of the company now is actuated by this type of drive.

Steel Rod Rate Is Found Discriminatory

Washington, June 28.—Rates charged on steel rods, in straight lengths, in carloads, from Pittsburgh and Johnstown, Pa., Youngstown, O., and Buffalo and North Tonawanda, N. Y., to Pawtucket and Valley Falls, R. I., have not been found unreasonable by the interstate commerce commission but unjustly discriminatory and unduly prejudicial to the extent that they exceed the contemporaneous rates on the same commodity when shipped in coils. Unjust discrimination and undue prejudices have been ordered removed and reparation denied. The decision was in the case of the Standard Nut & Bolt Co., against the New York, New Haven & Hartford railroad.

Stoker Sales Gaining

Washington, June 28.—Following a low period in April, sales of mechanical stokers in May staged a slight comeback, reports from 11 producers to the department of commerce show. Of the 97 stokers sold, 16 were for use with fire tube boilers and the remainder for use with water tube boilers. Other comparisons follow:

	Stokers sold	Fire tube boilers	Water tube boilers
1923 Total	1,464	177	1,287
1924 Total	1,128	161	967
1925 Total	1,348	263	1,085
1926			
May	129	54	75
June	175	24	151
July	125	20	105
August	104	25	79
September	127	31	96
October	112	28	84
November	85	25	60
December	72	7	65
Total	1,361	289	1,072
January, 1927	69	18	51
February	105	27	78
March	115	25	90
April	77	22	55
May	97	16	81

Want City Foundry Run

Chicago, June 28.—A movement has been started by several city aldermen to reopen the Chicago municipal shops and foundry at Thirty-first street and Sacramento avenue, which were closed five years ago because they failed to yield a profit.

Apex Ventilating & Engineering Co., 12 South Clinton street, Chicago, has increased capital from $5,000 to $10,000.

Fluorspar Output Shows Increase in 1926

Washington, June 28.—Aided by record-breaking production of steel, the fluorspar industry showed an increase of 13 per cent in domestic shipments in 1926 over 1925, according to the bureau of mines. Imports of fluorspar in 1926, however, increased 55 per cent over 1925. Shipments from United States mines in 1926 were valued at $2,341,277, and totaled 128,657 short tons, compared with $2,052,342 and 113,669 tons in 1925. Reported shipments of fluorspar to manufacturers of steel, glass and enamel and sanitary ware were higher than in 1925 but foundries and manufacturers of hydrofluoric acid received less. The general average value per ton, f.o.b. shipping points, of all grades in 1926 was $18.20, compared with $18.06 in 1925.

Illinois mines shipped 53,734 tons in 1926 compared with 54,428 tons in 1925; Kentucky, 62,494 tons in 1926 as against 44,826 tons in 1925; Colorado, and New Mexico, 12,429 tons in 1926 compared with 11,776 tons for Colorado and 2639 tons for New Mexico in 1925. Spain was a shipper of fluorspar to the United States in 1926 for the first time. France's exports to the United States gained 340 per cent while those of Italy dropped 68 per cent.

Imports of fluorspar from Canada were resumed in 1926. United Kingdom supplied 39 per cent of the total for 1926 and Germany furnished 27 per cent. Of the 171,733 tons consumed in the United States, 140,449 tons went into basic open hearth steel production.

Kansas Compensation Benefits Increased

With a revision of the Kansas workmen's compensation law approved by the governor, and going in effect July 1, the administration of the law is transferred from the state courts to the public service commission. The commission is especially charged with labor problems and duties under the compensation law. The law has been in effect 16 years. The maximum death benefit has been raised from $3800 to $4000. The weekly maximum benefit has been raised from $15 to $18, the percentage of weekly wage being changed from 50 to 60 per cent. The obligation of the employer to furnish medical treatment is made absolute instead of being on demand as formerly.

Construction and Enterprise

Concise Timely Business Building Opportunities
from the Field of Industry

MOBILE, ALA.—Machinery contracts for coal handling plant to be built by state dock commission have been let to Mead-Morrison Mfg. Co., New York, Robins Conveying Belt Co., New York and Link-Belt Co., Chicago.

TALLADEGA, ALA.—Turner Jones, one of the promoters of the new Talladega cast iron high pressure pipe shop, will purchase equipment for a foundry, which will be erected in the near future. Operation of the plant is expected in October.

CLARKSVILLE, ARK.—Central Anthracite Coal Co., capital $50,000, incorporated by William McLachlan, president, and E. L. Matlock, secretary-treasurer.

ELDORADO, ARK.—William Peterson, Little Rock, was awarded contract for construction of Union county courthouse, 4 stories and basement, at bid of $692,500.

LOS ANGELES—Rotary Disc Bit Co., Fifty-fifth and Alameda streets, maker of oil well bits and drilling tools, plans to build several units of a new plant on newly acquired property.

NEW HAVEN, CONN.—Reliable Mfg. Co., 38 Canal street, has been incorporated to manufacture tools, dies and light machinery in its own plant.

WATERBURY, CONN.—Standard Wire Die Co., 4 Farnman avenue, has been incorporated to manufacture wire drawing dies and tools for truing emery wheels.

CHICAGO—O'Gara Coal Co., 810 South Michigan boulevard, will build a steel tipple at its property at Harrisburg, Ill. Allen & Garcia, 1 East Van Buren street, Chicago, are architects and engineers.

Where additional information is presented, reference is made to date of issue in which previous item appeared.

CHICAGO—Chute Mfg. Co., 4824 West Lake street, makers of builders' hardware, has awarded the contract for a 1-story factory.

CHICAGO—Mall Tool Co., 8389 South Chicago avenue, will build a 1 and 2-story factory 50 x 135 feet.

CHICAGO—Chicago Coated Board division of Robert Gair Co., 420 North Water street, will build a 2-story machine shop.

CHICAGO—Automobile Equipment Mfg. Corp., 1908 Indiana avenue, will rebuild its factory following damage done by fire.

CHICAGO—Grinnell Co. Inc., 208 South LaSalle street, has awarded the contract for a 1 and 2-story warehouse and pipe shop, 76 x 275 feet, at 4409 South Western avenue.

CHICAGO—Northwest Side Iron Works, 1518 Western avenue, will build a 1-story steel fabricating plant. H. Miller, 5 North LaSalle street, is engineer.

CHICAGO—Excel Plating Co. Inc., 1042 West Lake street, has been incorporated with $10,000 capital to engage in the general gold, brass and copper plating business, by Adams & Adams, 6 North Clark street.

CHICAGO—Arrow Machine Co., B. Pistorious, 1225 Maplewood avenue, architect, has awarded the general contract for a 1-story factory to George Kehl & Sons, 1225 Maplewood avenue.

CHICAGO—Amador Electric Specialties Mfg. Co., 140 South Dearborn street, suite 1722, has been incorporated with $24,000 capital to manufacture electrical machinery and tools, by Emil R. Cappelle, Charles R. Kershaw and Bob B. Hollock. Netherton & Netherton, Marquette building, are correspondents.

HARVEY, ILL.—Whiting Corp., J. H. Whiting, president, 157th street, will build a 1-story foundry and revised plans are now being drawn. (Noted March 24)

MOLINE, ILL.—Williams, White & Co. will build a foundry addition 115 x 300 feet.

SILVIS, ILL.—Chicago, Rock Island and Pacific railroad has awarded the general contract for a 1-story machine shop addition to T. S. Leake, 608 South Dearborn street, Chicago. (Noted April 21)

ELKHART, IND.—Curtain Supply Co. plans to build a foundry addition. Mundie & Jensen, 39 South LaSalle street, are architects.

INDIANAPOLIS—Stone Auto Co., 540 East Washington street, will build a 2-story machine shop and service station, 50 x 195 feet.

NEWTON, IOWA—J. H. Bruhn is having

Industrial Business Changes

STROMBERG ELECTRIC CO., Chicago, manufacturer of electric time systems equipment, announces the removal of its Buffalo, N. Y., district sales office from the Statler hotel to 769 Gerrans building, and the appointment of E. W. Funk as district sales manager in charge of Buffalo territory. Mr. Funk formerly was with the Philadelphia sales organization. The company also announces the opening of a district sales office at 506 City Bank building, Syracuse, N. Y., with R. H. Rudy in charge.

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Foos Gas Engine Co., Springfield, O., has changed its name to Foos Engine Co.

* * *

Brown Instrument Co., Philadelphia, has established a repair and service station at 217 East Illinois street, Chicago.

* * *

Smith Gas Engineering Co., Dayton, O., manufacturer of gas handling devices, has changed its name to the Gas Research Co.

* * *

Natisch Gear Works, 16 Jefferson avenue, Brooklyn, N. Y., has changed its name to Atlantic Gear Works.

* * *

William Ganschow Co., Chicago, has appointed Schroes Bros., 2303 Holmes street, Kansas City, Mo., its representative for Kansas and Oklahoma.

* * *

Rose City Ornamental Iron Works, 1295 Hood street, Portland, Oreg., has been bought by the Portland Ornamental Iron Works.

* * *

Sutton Abramsen Engineering Co., Park building, Pittsburgh, has changed its name to the Sutton Engineering Co. It manufactures bar-straightening machines.

* * *

Hall Steel Joist Co., Milwaukee, has moved its main offices from the Enterprise building, 210 Michigan street, to its works at 1420 Thirty-third street.

* * *

Grindle Fuel Equipment Co., Harvey, Ill., has made the Dennis Engineering Co., 243 North High street, Columbus, O., and the Burdick-Pensinger Co., 3409 East Eighteenth street, Kansas City, Mo., sales representatives for its pulverized coal systems.

Iron and Manganese Ores and Minerals

LAKE SUPERIOR ORES

Iron Ore

Per Gross Ton Lower Lake Ports

Old range bessemer, 51½ per cent iron	$4.55
Mesabi bessemer, 51½ per cent iron	4.40
Old range nonbessemer, 51½ per cent iron	4.40
Mesabi nonbessemer, 51½ per cent iron	4.25

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic 53 to 63 per cent	9.00 to 10.50
Copper free low phosphorus 53 to 65 per cent	nominal

FOREIGN IRON ORE

Cents per unit, alongside docks, Atlantic ports

Spanish manganiferous ore, 54 per cent iron and 2 to 4 per cent manganese	10.25 to 10.50
North African low phosphorus	10.50 to 11.50
Swedish foundry or basic, 62 to 65 per cent	9.00 to 9.50
Spanish foundry or basic, 52 to 56 per cent	9.00 to 9.50
North African foundry and basic 50 to 56 per cent	9.00 to 9.50

Manganese Ore

Prices do not include duty at rate of 1 cent per pound of metalic manganese contained.

Brazilian	37 to 38 cents
Indian	37 to 38 cents
Caucasian, 53 to 55 per cent washed	38 to 40 cents

Fluor Spar

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton	$17.25 to 18.00
Washed gravel, imported duty paid eastern tidewater, per ton	16.50 to 17.00

plans made for a factory building for the manufacture of automatic fire and burglar signal phone systems.

ORANGE CITY, IOWA—The O. C. Mfg. Co., recently organized, plans to build a factory for the manufacture of a metal roof edging and a nailless barn batting. The company is composed of Cor. Vande Steeg, William Chambier and William Westra, local men, with L. C. Peterson of Denison, Iowa, who patented the articles to be manufactured.

SIOUX CITY, IOWA.—Albertson & Co., 3100 Floyd avenue, maker of mechanical equipment, will build a 4-story addition 43 x 135 feet. K. E. Westerlind, War Eagle building, is architect.

COFFEYVILLE, KANS.—Ozark Smelting & Mining Co. plans construction of a sulphuric acid plant as addition to its zinc smelting plant. H. J. Bain is vice president and general manager.

HUTCHINSON, KANS.—Massey-Harris Harvester Co. will build a 1-story addition to its plant.

BATON ROUGE, LA.—Baton Rouge Electrical & Machine Works has received contract for electrical machinery and fixtures for new Glassell hotel now under construction. Maurice Sachse is general manager.

MONROE, LA.—Monroe Roofing & Sheet Metal Works has been incorporated for $10,000 by T. F. Terzia, president, P. P. Mathews, vice president and F. A. Terzia, secretary-treasurer.

NEW ORLEANS—Euride Chemical Co. of Missouri has obtained option on 300 acres at Luling, La., as site for new plant.

NEW ORLEANS—Titmas Co., capital $15,000, incorporated by R. W. Titmas, president, Union Indemnity building, C. G. Robinson and E. J. Rovira to manufacture oil burners and metal specialties.

NEW ORLEANS—C. C. Elmer Tank & Boiler Works has changed its domicile to Jefferson Parish, across the river from New Orleans and reincorporated with capital stock of $25,000. C. C. Elmer, 5728 Rosemary street, is president.

SHREVEPORT, LA.—Woodman Mfg. Co., manufacturer of automobile oiling devices, has started operation of plant at 1803 Texas avenue, with capacity of 800 oilers a day.

BALTIMORE—Cherry-Bassett Co., Russell and Ostend streets, maker of dairy equipment and supplies, has awarded the general contract for two 1-story additions, 40 x 160 feet and 40 x 70 feet, to the Blaw Knox Co., Blawknox, Pa. Louis Rosenfeld is general manager.

CHARLESTOWN, MASS.—Charlestown Gas & Electric Co., Main street, will build a new mechanical repair shop at 25 Arlington street.

CLINTON, MASS.—Armion Textile Corp. has leased a factory here and is installing machinery for the making of yarn for the Long Island, N. Y. mills.

SPRINGFIELD, MASS.—United Electric Light Co. will build a new power plant, and equipment will include transformers, switches, steel structurals and other materials.

WORCESTER, MASS.—Sleeper & Hartley Inc., makers of wire drawing and other machinery, will build a plant addition.

DETROIT—Standard Appliance Corp. has been incorporated with $50,000 capital to manufacture electric household appliances by Edward S. Murphy, Hotel Statler; Elizabeth Murphy and Lynn A. Morey.

DETROIT—Michigan Axle Shaft Co. has been incorporated with $7500 capital to engage in general machine shop business by Leo Grossman, 3256 Calvert street; Irving Cooper and Frank Cooper.

DETROIT—Motor Replacement Service Inc. has been incorporated with $5000 capital to engage in a general machine shop business by Alex Nugent, 5074 Crane street; George Cuthbert and Henry Carlile.

DETROIT—DuMore Tap & Tool Co. has been incorporated with $15,000 capital to manufacture taps, dies and other metal working tools and machinery, by Harry A. Kaiser, 19229 Omira avenue; J. H. Blom and L. M. Venn.

HASTINGS, MINN.—Major R. C. Williams, government engineer, St. Paul, will make technical survey of site for steel and concrete dam and locks to be built three miles above Hastings on the Mississippi river to provide a 6-foot channel for barge traffic, to cost $4,000,000. United States government engineers will begin work on actual plans Sept. 1, and bids will be taken about Feb. 1, 1928.

STILLWATER, MINN.—Bids will soon be received by the Minnesota state board of administration and finance, room 10, state capitol building, St. Paul, for building a steel and stone addition to the state prison, including heavy steels cells to accommodate 200 prisoners, to cost $250,000. C. H. Johnston, 715 Capital Bank building, St. Paul, is architect.

WINONA, MINN.—Mississippi Valley Public Service Co. will build an addition to steam plant and install new steam turbine at cost of $30,000. Mead & Seastone, Madison, Wis., are the engineers.

JACKSON, MISS.—Salem Products Co., steel fabricator and tank manufacturer, Winston-Salem, N. C., has purchased site near fair grounds for new plant. R. N. Brown is general manager.

LAUREL, MISS.—A. Garrett, Canal and Commercial Bank building, New Orleans, has been awarded contract for new plant of Mississippi Gas & Coke Co., costing $500,000.

CALIFORNIA, MO.—City of California, Jack Bowlin, mayor, will build a power and pump house.

JOPLIN, MO.—Ozark Engineering Co. has taken over former plant of Concrete & Steel Construction Co., 80 x 80 feet, for fabricating shop.

BAYONNE, N. J.—Bergen Point Iron Works, West Fifth street, has awarded the general contract for a 2-story addition to A. A. MacMille, 724 Broadway.

JERSEY CITY, N. J.—American Can Co., 120 Broadway, New York, will build an 8-story plant, 200 x 900 feet, here. C. G. Reiss is engineer. (Noted May 19.)

PASSAIC, N. J.—S. Minkov & Son Inc. has been incorporated with $25,000 capital to deal in iron products by Aaron Minkov, Solomon Minkov and Julia E. Zarello. Harry Loeb, Passaic, is attorney.

BROOKLYN, N. Y.—Silver King Ice Skate Corp. has been incorporated with $25,000 capital by I. Block, 2 Lafayette street, Manhattan.

LONG ISLAND CITY, N. Y.—Meurer Steel Barrel Co., 23 East Forty-third street, New York, has awarded the general contract for a 2-story factory to Merolan Bros., 2376 First avenue, New York.

NEW YORK—Consolidated Gas Co., 130 East Fifteenth street, will build a 1-story addition 175 x 190 feet to its plant.

NEW YORK—Wesberg Bros. has been incorporated with $30,000 capital to manufacture metal specialties by Epstein & Bros., 2 Rcetor street.

NEW YORK—Wide Awake Alarm Co. has been incorporated with $20,000 capital to manufacture door alarms by S. Herzog, 116 Nassaue street.

NEW YORK—Bellanca Aircraft Corp. has been incorporated with $1,000,000 capital to manufacture airships and dirigibles, by Andrew Bellanca, 165 Broadway; Mina E. Seidel; David O. Decker.

NEW YORK—A. C. Chesley Co., 704 East 133d street, Adolph J. Chesley, president, maker of hollow metal and metal covered fireproof doors, will build a 1-story plant, 100 x 100 feet.

NEW YORK—Stevens & Wood Inc., engi-

neers and constructure, 120 Broadway, have been retained by the board of transportation, New York, to study the method to be adopted to provide electric power for the new rapid transit lines.

MANDAN, N. DAK.—Northern Pacific railroad, Fifth and Jackson street, St. Paul, will soon begin work on 48 x 105-foot steel and concrete power plant including a 7½-foot chimney 165 feet high, to furnish power for terminal shops here where extensive engine and car repairs are made. Steam generating equipment will consist of two 200-horsepower and one 300-horsepower water tube boilers provided with furnaces, stokers and feed draft for burning western coal.

DICKINSON, N. D.—Hughes-Deiters Co. will build addition to power plant to provide more room, installation of a new generating unit and addition of new boilers and automatic stokers.

AKRON, O.—General Tire & Rubber Co. will add two wings to its factory to increase its production.

CLEVELAND—Weber Brass Co. will erect a new plant at Emerald court and East Twelfth street.

DAYTON, O.—Master Electric Co., Linden and Master avenues, has awarded the contract for a 1-story addition to be equipped as a foundry, to Huffman Realty Co., Dayton.

HAMILTON, O.—Hamilton Caster Mfg. Co., J. Weigel, Dixie Highway, manager, will build a 2-story factory addition.

MIDDLETOWN, O.—Advance Bag Co. plans expanding its plant to include an electric power plant and a pulp mill.

BARTLESVILLE, OKLA.—Empire Natural Gas Co. has let contract to C. & G. Cooper Co. for eleven 1000-horsepower and four 500-horsepower gas engine compressor units and six 190-horsepower auxiliary electric units for the Amarillo-Wichita 20-inch gas pipeline

ENID, OKLA.—Franks Machine Shop, 205 East Main street, has installed motor driven grinding machinery.

GARBER, OKLA.—Standard Equipment Co., capital $100,000, chartered by George E. Failing, G. J. Taft and G. A. Garber to handle oil field equipment specialties.

OKLAHOMA CITY, OKLA.—J. B. Klein Iron & Foundry Co. has added warehouse 50 x 120 feet for stocking of building specialties.

OKLAHOMA CITY, OKLA.—Oklahoma Pattern & Brass Works, R. J. McAusland, manager, is building new plant at Fifth and Kentucky streets, including foundry 52 x 80 feet and machine shop 48 x 100 feet.

OKLAHOMA CITY, OKLA.—Best Blade & Holder Co., capital $25,000, incorporated by A. C. Enochs and L. J. Milburn, Oklahoma City, and M. V. Benson, Enid, Okla., to manufacture device for agricultural implements.

OKLAHOMA CITY, OKLA.—J. B. Klein Iron & Foundry Co. has contract for structural steel and miscellaneous iron for garage being built by James H. Fore at Wewoka, Okla. Building will be three stories, contain modern repair shop, and cost $75,000.

TONKAWA, OKLA.—Williams Iron Works Inc. will build a 1-story machine shop 35 x 150 feet.

TULSA, OKLA.—Public Service Co. will build 6-story office building, 80 x 140 feet, at Sixth and Main streets.

TULSA, OKLA.—L. B. Hoss Tanks, capital $25,000, incorporated by L. B. Hoss, 1611 South Norfolk, H. M. Hoss and H. W. Callahan to deal in steel and wood tanks.

TULSA, OKLA.—Vulcan Steel Tank Corp. is building shop 85 x 200 feet on Dawson road for fabrication of plates in tank and boiler work. J. F. McKelvey is president and general manager.

TULSA, OKLA.—Equipment of Tulsa Brass Castings Co., recently sold under receiver's order has been purchased by Progressive Brass Mfg. Co. of Kansas City which has acquired a Tulsa branch plant at 800 East First street.

TULSA, OKLA.—Vulcan Steel Tank Corp. has neared completion on the main building of its shop where steel tank plates will be fabricated and other units will be added as needed. J. F. McKelvey is president. (Noted March 24).

TULSA, OKLA.—Purchase of controlling interest in Oklahoma Natural Gas Corp. by Phillips Petroleum Co. means ultimate extension of gas pipelines from southern Oklahoma to Texas Panhandle field. R. C. Sharp remains as vice president and general manager of gas division.

OREGON CITY, OREG.—Hawley Pulp & Paper Co., Oregon City, Oreg., has let general contract to A. Guthrie & Co. Inc., 1209 Builders Exchange, St. Paul, for steel and reinforced concrete paper mill including complete equipment to cost $600,000.

PHILADELPHIA—Marine Engineering Co. has been incorporated recently under the laws of New Jersey John F. Metten, formerly chief engineer of William Cramp & Sons Ship & Engine Building Co., is president.

PHILADELPHIA—Columbia Steel Equipment Co., Philip Bergman, 1735 Chestnut street, secretary, has awarded the general contract for a 2-story factory, to Harry H. Weymeter, 509 Cumberland street.

PITTSBURGH—National Steel Fabric Co. has been incorporated with $50,000 capital by K. W. Warmcastle, 6401 Wilkins avenue.

PITTSBURGH—Portable Lamp & Equipment Co. has been incorporated with $5000 capital by George C. Nelms, 6349 Douglas street.

PROVIDENCE, R. I.—Grinnell Co., maker of welded pipe lines and bends will build a 1 and 2-story factory branch, pipe shop and distributing works, 175 x 275, at Chicago. The Chicago offices of the company are at 208 South LaSalle street.

MEMPHIS, TENN.—Southern Motor Co. plans to install a machine and repair shop in its proposed 1-story service station and garage, 90 x 300 feet. Joseph T. Wallace, Bank of Commerce building, is architect.

BORGER, TEX.—Gibson Machine & Tool Co., capital $100,000, chartered by W. R. Crusoe, C. R. Kinsey and P. Axelrod to operate machine shop for manufacture and repair of oil field tools.

DALLAS, TEX.—McKenzie Construction Co. has contract for Medical Arts building annex, including 17 stories and basement, costing $800,000. Reinforced and steel construction will be used.

EASTLAND, TEX.—Oil Belt Power Co., J. E. Lewis, general manager, will increase capacity of generating plant by addition of engines generating 20,000 horsepower and will build new high lines of 132,000-volt capacity from Eastlandto Big Spring, Tex.

FORT WORTH, TEX.—Van Zandt Refrigerating Machine Co., capital $60,000, chartered by J. H. Van Zandt, L. H. Van Zandt and I. L. Van Zandt Jr. to deal in refrigerating machinery.

HOUSTON, TEX.—Reading Iron Co. of Texas incorporated with $10,000 capital by H. F. Mattern, Rupert Cox and R. D. Oberwetter.

HOUSTON, TEX.—Central Screen & Mfg. Co., capital $3000, incorporated by W. C. Weis, Frank J. Crosby and Addie Weis to manufacture metal screens and building specialties.

HOUSTON, TEX.—Efficiency Pump & Compressor Co., capital $20,000, incorporated by J. E. Smith, J. E. Wilson and F. H. Lawson to deal in pumps and compressing machinery.

SAN BENITO, TEX.—Valley Plumbing & Sheet Metal Co., capital $2,500, incorporated by H. S. Collins, F. G. Collins and E. W. McAllister.

WICHITA FALLS, TEX.—Panhandle Steel Products Co. has acquired tank and structural steel department of Panhandle Refining Co.

WICHITA FALLS, TEX.—Panhandle Steel Products Co., capital $75,000, chartered by Roy B. Jones, John Tancred and W. D. Brookover to handle a general line of building material and steel products.

NORFOLK, VA.—Southeastern Machinery Equipment Corp. has been incorporated with $50,000 capital by John D. Westbrook, Water street; R. V. Williams; T. J. Pratt, Lansing Apt.

TACOMA, WASH.—Olaf Holte has awarded the general contract for a 1-story welding and machine shop to H. E. Blows Co., 324 California building.

APPLETON, WIS.—I. H. Bahcall, scrap metal, 1001 North Mead street, has started work on the construction of a new warehouse and handling plant, 66 x 75 feet, costing about $20,000.

EAU CLAIRE, WIS.—International Harvester Co. will soon begin work on a 1-story, 100 x 150-foot steel and concrete service station at Wisconsin and Putnam streets. A. B. Clancy is manager of the Eau Claire plant.

GREEN BAY, WIS.—D. Miller Scrap Iron Co., 1109 Main street, has been incorporated with $10,000 capital stock by M. Miller, E. L. Everson and Lynn D. Jaseph.

KEWAUNEE, WIS.—Leyse Aluminum Co., maker of aluminum stampings and novelties, has awarded the general contract for a 2-story manufacturing addition, 56 x 100 feet to H. J. Selmer Co., Green Bay, Wis.

MARSHFIELD, WIS.—Palace Garage Co. will close bids June 24 with G. A. Krasin, local

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. works

Pennsylvania, No. 1	$43.00
Pennsylvania, No. 2	35.00
Ohio, No. 1	43.00
Ohio, No. 2	35.00
Illinois, No. 1	40.00 to 43.00
Illinois, No. 2	35.00
Kentucky, No. 1	43.00
Kentucky, No. 2	35.00
Missouri, high grade	43.00
Missouri, No. 1	35.00
Maryland, No. 1	43.00 to 44.00
Maryland, No. 2	35.00
Georgia and Ala. No. 1	40.00 to 45.00
Georgia and Ala. No. 2	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill.	52.00
Birmingham	49.00

MAGNESITE BRICK

(Per Net Ton)

9 x 4½ x 2½	65.00

CHROME BRICK

Per Net Ton Seaboard Base

9 x 4½ x 2½	45.00

architect, for the construction of a $50,000 garage and service building.

MENASHA, WIS.—The common council has engaged the A. E. McMahon Engineering Co., Menasha, to prepare plans for a municipal water filtration plant with a capacity of 2,000,000 gallons and to cost about $100,000. The plant will cover an area of 80 x 135 feet. No date has been set for taking bids on building and equipment, pumps, tanks, filters, etc. John Jedwabny Jr. is city clerk.

MILWAUKEE—Milwaukee Electric Railway & Light Co. will make additions and extensions to its power distribution system. George B. Post is chief electrical engineer.

MILWAUKEE—L. Teweles Seed Co., 152 Hanover street, is taking bids through the Fraser Co., 667 East Water street, for the construction of a 7-story elevator addition, 70 x 100 feet, 98 feet high.

MILWAUKEE—Milwaukee sewerage commission is asking bids until June 24 for a complete coal handling installation in the dryer house of the Jones island sewage disposal plant. J. H. Fowles is secretary.

MILWAUKEE—Archie O. Muehl, secretary of the board of industrial education of Milwaukee, Sixth and Highland avenue, has taken bids for the completion of the third unit of the Central Continuation school, each costing about $1,500,000.

MILWAUKEE—H. C. Hengels, architect, 445 Milwaukee street, is preparing plans for a $35,000 garbage incinerating plant, 30 x 50 feet, and a municipal service building for trucks, tractors, etc., for the village of Shorewood, Milwaukee county. H. A. Schmitt is village engineer.

MILWAUKEE—Rundle Mfg. Co., Twenty-seventh and Cleveland avenues, Milwaukee, maker of plumbers' and steamfitters' supplies and materials, will make improvements costing $30,000, including a new engine room, 45 x 54 feet; an enameling room, 61 x 112, a foundry, 73 x 83 feet, and a shop addition, 24 x 112 feet.

MILWAUKEE—Rundle Mfg. Co., Twenty-seventh and Cleveland avenues, maker of plumbing supplies, materials, etc., is about to award contracts for extensive alterations in and additions to its power supply. The work is in charge of Charles A. Cahill & Son, consulting engineers, 217 West Water street, Milwaukee. Henry Held is president and general manager.

OSHKOSH, WIS.—Universal Motor Co., 39 Ceape street, will build a new plant and office building, 150 x 378 feet, with a boiler room, 40 x 50 feet at the rear. The general contract has been awarded to Fluor Bros. Construction Co. E. H. Fahrney is president.

OSHKOSH, WIS.—Wisconsin Iron & Metal Co., 128 Washington street, will build a new refining plant and scrap handling building to replace those destroyed by fire. The main building will be 100 x 150 feet, and the foundry 60 x 120 feet. Morris Block is president.

RACINE, WIS.—Universal Vibrating Screen Co. has been incorporated with $12,000 capital to manufacture vibrating screens for screening coal, clay and stone. A. L. Adrianson, Racine, is president.

RACINE, WIS.—The municipal water commission has accepted the bid of the DeLaval Steam Turbine Co., Chicago, for a high lift pump for the new filtration plant at $27,427, and let a low lift pump to the Allis-Chalmers Mfg. Co., Milwaukee, at $7,079.

STURGEON BAY, WIS.—Severson & Konnard, John and Garland streets, will build a 2-story shop and service station, 80 x 100 feet.

WEST BEND, WIS.—Bids will close July 7 with C. P. Heipp, city clerk, for the construction of a new artesian well and for the pumping machinery, motor, automatic control and other requirements of an additional water supply estimated to cost $20,000. P. L. Clark, Appleton, Wis., is consulting engineer.

Business in Canada

WAINWRIGHT, ALTA.—Construction work will be started at once on the first unit of a 10,000-barrel a day oil refinery here for the Price Oil Development & Refining Co., according to R. A. Price, president of the company. Another plant will be established at either Saskatoon, Sask., or Vancouver, B. C.

VANCOUVER, B. C.—Reliance Foundry Co., which recently completed a large addition to its plant, doubling the former capacity, now proposes to install a modern electric furnace for the production of steel castings.

VANCOUVER, B. C.—Dominion Bridge Co., head office, Montreal, Que., which is establishing a $300,000 plant here, has completed plans for the purchase of the entire stock and plant of the Canadian Northwest Steel Co., at Vancouver.

WINNIPEG, MAN.—Scarab Mines Ltd. has been incorporated to mine, smelt and refine ores, metal and minerals with 200,000 shares of no par value by Wm. S. Inglis, Richard A. Shattuck, and Arthur J. Merrill.

ANTIGONISH, N. S.—Canada Cement Co. Ltd., Canada Cement building, Montreal, Que., is having plans prepared for a crushing plant here. S. Barr is engineer.

CORNWALL, ONT.—Foundation Co. of Canada Ltd., 746 Sherbrooke street west, Montreal, Que., has been awarded general contract for $300,000 addition to the factory here of Courtaulds Ltd., Montreal.

GRIMSBY, ONT.—Town council proposes to spend $100,000 for a sewage disposal plant here. Pumps and other equipment will be purchased.

HAMILTON, ONT.—Hamilton Street Railway Co. will build car shops and bus garage here to cost $350,000. Bernard H. Prack, 608 Lister building, is architect.

HAMILTON, ONT.—Ice-A Teria Refrigerator Co. Ltd. has been incorporated to manufacture and deal in mechanical and electrical devices, machines, engines and refrigerators, with $300,000 capital by Harry O. Braden, Willis Lagarie, Charles Bates and others.

KITCHENER, ONT.—Wilkinson Motors Ltd. has been incorporated to manufacture and deal in automobiles, bicycles, motor engines etc. with $40,000 capital by Harold C. Wilkinson. Frank L. Sheppard, and Charles T. Dahmer.

OSHAWA, ONT.—General Motors of Canada Ltd., 53 Mary street, has awarded contract to the Jackson Lewis Co. Ltd., Federal building, Toronto, Ont., for plant additions to cost approximately $600,000. Additions include a stamping building, 200 x 500 feet, concrete, brick and steel construction; addition to machine shop, 70 x 100 feet, structural steel frame, brick curtain walls; and enameling plant, 50 x 250 feet, concrete, brick and steel construction. Architects, Hutton & Souter, 6 James street south, Hamilton, Ont.

OTTAWA, ONT.—Ollier Mines Ltd. has been incorporated to mine, smelt and refine ores, metals and minerals, with 1,500,000 shares of no par value by Frederick W. Blakeman, Allan T. Lewis, James F. Smellie and others.

New Trade Publications

ACID-RESISTING PUMPS—Duriron Co., Dayton, O., manufacturer of metals designed for use with corrosive fluids, in a current bulletin describes two types of pumps for moving acids. Diagrams illustrate their use.

SAW SHARPENERS—Machinery Co. of America, Big Rapids, Mich., has issued a bulletin covering several types of sharpeners designed for use in reconditioning circular saws.

MOTORS—Wagner Electric Corp., St. Louis, is issuing a bulletin describing construction and characteristics of its line of alternating current motors. Economy from the proper power factor is discussed.

OUTBOARD BEARINGS—Boston Gear Works Sales Co., Norfolk Downs, Mass., has released to the trade a circular on its adjustable outboard bearings. They are designed for use as support for bearing shafts, countershaft hangers, temporary bearing for future adjustment, gear mount and as pillow blocks. Diagrams and engineering data guide to choice of proper size.

SHEET METAL DIES—Niagara Machine & Tool Works, Buffalo, is distributing a leaflet calling attention to its dies for sheet metal work and presses in which they are used. Various classes of die work are illustrated.

BRASS FITTINGS—Mueller Brass Co., Port Huron, Mich., manufacturer of brass products, has prepared a circular featuring its brass fittings and parts for electric refrigerators. From stock or by special order a wide variety of fittings its available. It is illustrated.

ELECTRIC FURNACES—C. I. Hayes, industrial electric heating engineer, Providence, R. I., has issued a bulletin describing a type of furnace for forging, heat treating, melting nonferrous metals, hardening, testing fire clays and firing pottery and ceramics. Illustrations and diagrams cover its construction and operation.

STEEL PARTITIONS—E. F. Hauserman Co., Cleveland, is distributing a broadside to show wide use of its line of steel partitions for office and industrial use. Typical installations are illustrated and a list of prominent structures so equipped is given.

FLEXIBLE COUPLING—W. H. Nicholson & Co., Wilkes-Barre, Pa., is distributing a bulletin describing its all-metal, oiled, flexible coupling. Degrees of misalignment corrected by this coupling are illustrated. Details of construction and operation are shown. Halftones of installations are presented.

TRAMRAIL—Elimination of tugging and lugging by moving larger units of material in the industrial plant by the aid of tramrails is the text of a bulletin by the Cleveland Electric Tramrail division of the Cleveland Crane & Engineering Co., Wickliffe, O. Various applications are shown in illustrations.

Discounts and Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½
Lap Weld		
2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	60	48½
Lap Weld		
2-inch	53	41½
2½ to 6-inch	57	45½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
¼-inch	41	24½
⅜ and ⅝-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½
Lap Weld		
2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8 inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½
Lap Weld		
2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

(Note—Large jobbers obtain additional preferential discounts of 1 and 5 on black and 1½ and 5 on galvanized.)

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLINGS

Butt Weld		
¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13
Lap Weld		
1⅛ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
3 to 6-inch	28	13
7 to 12-inch	26	11
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld		
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½ inches	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	

(Note—Large jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized.)

Boiler Tubes

Pittsburgh less carload discounts. Carload 4 points larger

STEEL (Lap Welded)	
2 and 2¼-inch	23 off
2½ and 2¾-inch	33 off
3-inch	36 off
3¼ to 3¾-inch	38½ off
4 to 13-inch	42 off

(Note—Additional discounts of 5 to 7 extra 5 per cents now being given.)

CHARCOAL IRON	
1½-inch	+22
1¾-inch	+12
2 and 2¼-inch	+ 2
2½ to 3-inch	3
3¼ to 4½-inch	5

(Note—Additional discounts of 2 or 3 extra 5 per cents now being given.)

SEAMLESS COLD DRAWN	
1-inch	56 off
1¼ and 1½-inch	48 off
1¾-inch	32 off
2 and 2¼-inch	27 off
2½ and 2¾-inch	35 off
3-inch	41 off
3¼ and 3½-inch	43 off
4-inch	46 off
4½, 5 and 6-inch	41 off
SEAMLESS HOT ROLLED	
2 and 2½-inch	30 off
2½ and 2¾-inch	38 off
3-inch	44 off
3¼ and 3½-inch	46 off
4-inch	49 off
4½, 5 and 6-inch	44 off

(Note—Additional discounts of 2 or 3 extra 5 per cents now being given.)

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.20 per cent.....50 to 55 off
Carbon 0.30 to 0.40 per cent.....45 to 50 off

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Net prices per foot f.o.b. Pittsburgh

Outside diameter	Gage	Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅝-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, dated Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge, (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

All Plates, Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weigh—

Over 100 inches to and including 110 inches	.05c
Over 110 inches to and including 115 inches	.10c
Over 115 inches to and including 120 inches	.15c
Over 120 inches to and including 125 inches	.25c
Over 125 inches to and including 128 inches	.50c
Plates less than ¼-inch or lighter than 11 pounds per square foot.	
Over 72 inches to and including 84 inches	.10c
Over 84 inches to and including 96 inches	.20c
Over 96 inches to and including 100 inches	.30c
Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.	

GAGE

Plates not Exceeding 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 10.2 pounds per square foot, to and including 7.65 pounds per square foot .20c

Plates over 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds per square foot. 20c

Plates ordered 7.65 pounds per square foot .30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull materials subject to U. S. Navy Dept. Specifications for Medium or Soft Steel	.10c
High tensile hull steel subject to U. S. Navy Dept. or equivalent specifications	1.00c
Boiler steel subject to U. S. Navy Dept. Specifications, classes A and B	1.50c
Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.	

Floor Plates

Checkered plates 1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection .....No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet	No extra
Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.10c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

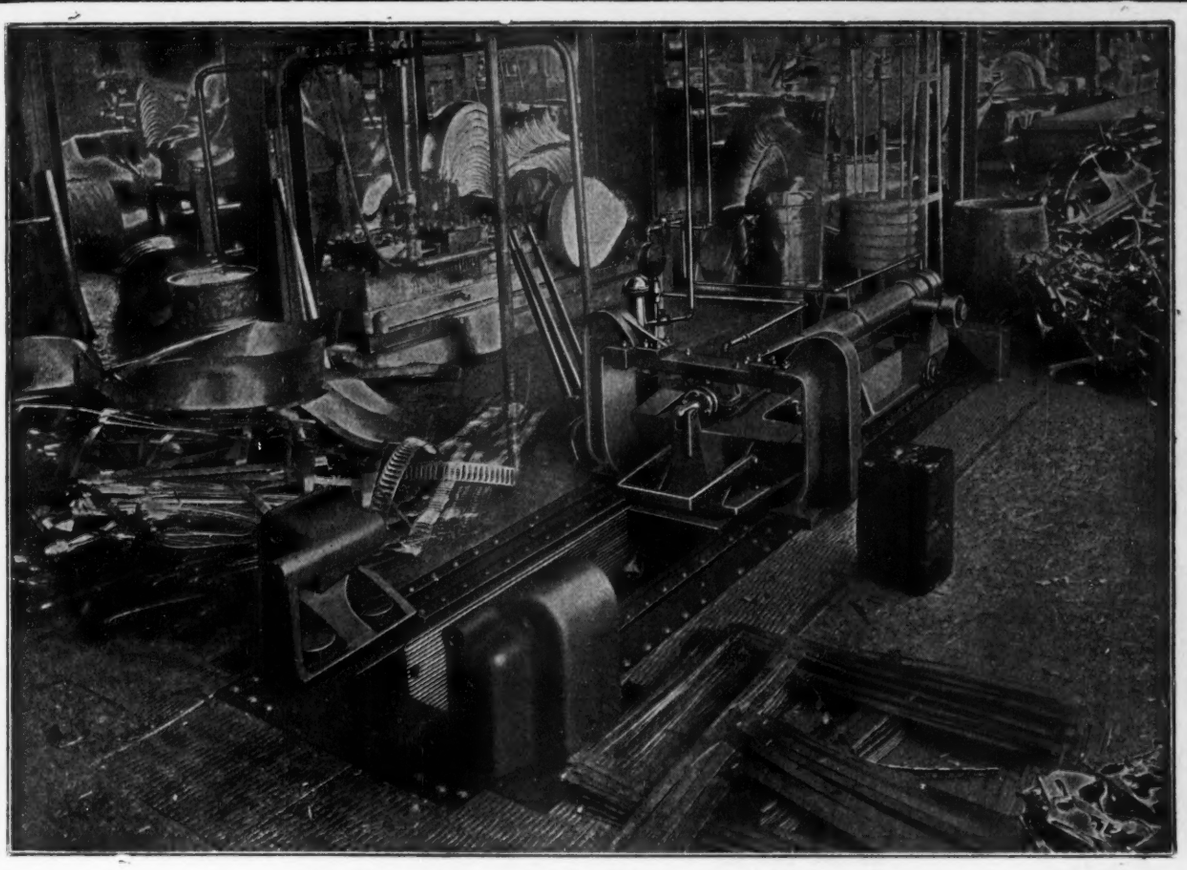
With not more than four straight cuts. (Including straight taper plates)

Additional extra ..... .10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with re-entrant angles)

Additional extra ..... .20c



Typical Installation in Well-Known Automobile Plant

WHY SHEET-SCRAP CAN BE PROFITABLY COMPRESSED

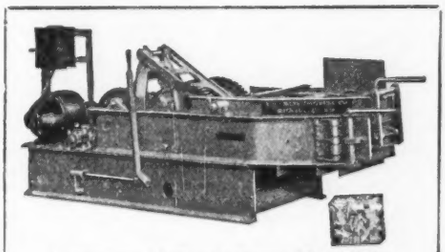
It commands at all times the best price;
It can be more conveniently stored;
It can be more economically handled;
It can be readily held for favorable markets;
It practically eliminates corrosion;
It permits of loading cars to capacity;
It saves much heat in remelting.

LOGEMANN SCRAP-METAL PRESSES

Hydraulic and Mechanical Types

LOGEMANN BROTHERS COMPANY
3126 Burleigh St. Milwaukee, Wis.

Also presses making crucible-size bricks of copper, brass, aluminum and other metals.



Logemann Mechanical-type Metal Baler

Please indicate character of scrap, quantity and heaviest gauge, when writing.

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A classified-by-products list of advertisers for the convenience of readers. If you don't find what you want, write us and we will tell you where to get it. ¶ Index to advertisements will give you page number of any advertisers and by referring to advertisement you can get full particulars about products.

ABRASIVE (Polishing)
Norton Co., Worcester, Mass.

ACCUMULATORS
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

ACETYLENE (Dissolved)
International Oxygen Co., Newark, N. J.
Prest-O-Lite Co., The, 30 E. 42nd St., New York City.

ACETYLENE GENERATORS
Air Reduction Sales Co., 342 Madison Ave., New York City.
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

ACETYLENE IN CYLINDERS
Air Reduction Sales Co., 342 Madison Ave., New York City.
International Oxygen Co., Newark, N. J.
Prest-O-Lite Co., The, 30 E. 42nd St., New York City.

ACIDS (Pickling)
American Chemical Paint Co., Ambler, Pa.

ADAMITE ROLLS
American Adamite Co., The, 12th and Etna Sts., Pittsburgh, Pa.

AIR COMPRESSORS—See COMPRESSORS (Air)

AIR CUSHIONS (Power Press)
Marquette Tool & Mfg. Co., 1908 S. Kilbourne Ave., Chicago, Ill.

AIR FILTERS
Midwest Air Filters, Inc., Bradford, Pa.

ALLOYS
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Metal & Thermit Corp., 120 Broadway, New York City.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
Vanadium Corp. of America, 120 Broadway, New York City.

ALUMINUM
Leavitt, C. W., & Co., 30 Church St., New York City.
Rogers Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.

ALUMINUM (Vanadium)
Vanadium Corp. of America, 120 Broadway, New York City.

ALUMINUM TUBING
Summerill Tubing Co., Bridgeport, Pa.

ANGLES, TEES, CHANNELS—See STEEL (Structural)

ANNEALING BOXES
Farrell-Cheek Steel Foundry Co., Sandusky, O.
Pittsburgh Annealing Box Co., 801 Beaver Ave., N.S., Pittsburgh, Pa.
Pittsburgh Malleable Iron Co., 34th and Smallman Sts., Pittsburgh Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Smith, George H., Steel Casting Co., Milwaukee, Wis.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Zanesville Malleable Co., Zanesville, O.

APPRAISALS
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.

AXLES
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Champion Machine & Forging Co., The, 3675 E. 78th St., Cleveland, O.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
National Tube Co., Frick Bldg., Pittsburgh, Pa.

BABBITT METAL
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.

BALING PRESSES
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.

BAND SAWS (Metal Cutting)
Huther Bros. Saw Mfg. Co., 1190 University Ave., Rochester, N. Y.

BANDS AND HOOPS (Galvanized Strips)
Sharon Steel Hoop Co., Sharon, Pa.

BANDS (Iron)
Bethlehem Steel Co., Bethlehem, Pa.

BANDS (Welded Iron and Steel)
Akron-Selle Co., Akron, O.

BAR BENDERS
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.

BARGES (Steel)
American Bridge Co., 71 Broadway, New York City.

BARRELS (Steel)
Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.

BARROWS
Sterling Wheelbarrow Co., Milwaukee, Wis.

BARS (Alloy)
Armstrong, Sir W. G., Whitworth & Co., Ltd., Kinnaird House, Pall Mall East, London, S. W. 1, England.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Wheelock, Lovejoy & Co., Inc., 128 Sidney St., Cambridge, Mass.

BARS (Concrete Reinforcements)
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Franklin Steel Works, Franklin, Pa.
Gulf States Steel Co., Brown-Marx Bldg., Birmingham, Ala.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Migret, Rene, 7 Boulevard Defontaine, Charleroi, Belgium.
Ryerson, Jos. T., & Son., Inc., 16th and Rockwell Sts. Chicago, Ill.

BARS (Iron and Steel)
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Morris, Wheeler & Co., 30th and Locust Sts., Philadelphia, Pa.
Penn Iron & Steel Co., Creighton, Pa.

BARS (Steel)
Armstrong, Sir W. G., Whitworth & Co., Ltd., Kinnaird House, Pall Mall East, London, S. W. 1, England.
Bethlehem Steel Co., Bethlehem, Pa.
Bliss & Laughlin, Inc., Harvey, Ill.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Franklin Steel Works, Franklin, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Migret, Rene, 7 Boulevard Defontaine, Charleroi, Belgium.
Pacific Coast Steel Co., Rialto Bldg., San Francisco, Calif.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., 1351 Brown-Marx Bldg., Birmingham, Ala.
Youngstown Sheet & Tube Co., Youngstown, O.

BARS, STEEL (Electric Furnace)
Timken Roller Bearing Co., The, Canton, O.

BEAMS, CHANNELS, ANGLES, ETC.
Bethlehem Steel Co., Bethlehem, Pa.
Blystone Mfg. Co., Ironton St., Cambridge Springs, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Migret, Rene, 7 Boulevard Defontaine, Charleroi, Belgium.
Phoenix Iron Co., The, 20 So. 15th St., Philadelphia, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

BEARINGS (Ball)
Hoover Steel Ball Co., Ann Arbor, Mich.
New Departure Mfg. Co., The, Bristol, Conn.
Norma-Hoffman Bearings Corp., Stamford, Conn.

BEARINGS (Journal)
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Hyatt Roller Bearing Co., Newark, N. J.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS (Motor)
Hoover Steel Ball Co., Ann Arbor, Mich.
Hyatt Roller Bearing Co., Newark, N. J.
Norma-Hoffmann Bearings Corp., Stamford, Conn.

BEARINGS (Oilless)
Rhoades, R. W., Metaline Co., Inc., Rhoades Bldg., Long Island City, N. Y.

BEARINGS (Roller)
Hoover Steel Ball Co., Ann Arbor, Mich.
Hyatt Roller Bearing Co., Newark, N. J.
Norma-Hoffmann Bearings Corp., Stamford, Conn.

BEARINGS (Tapered Roller)
Timken Roller Bearing Co., The, Canton, O.

BEARINGS (Thrust)
Hoover Steel Ball Co., Ann Arbor, Mich.
Norma-Hoffmann Bearings Corp., Stamford, Conn.
Timken Roller Bearing Co., The, Canton, O.

BELT FASTENERS
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.

BELT LACING (Leather)
Chicago Rawhide Mfg. Co., 1305 Elston Ave., Chicago, Ill.

BELTING (Leather)
Chicago Rawhide Mfg. Co., 1305 Elston Ave., Chicago, Ill.

BENCHES AND FRAMES (Drawing)
Morgan Construction Co., Worcester, Mass.

BENCHES AND FRAMES (Wire Drawing)
Vaughn Machinery Co., Cuyahoga Falls, O.

BENDING AND STRAIGHTENING MACHINES
Cleveland Punch & Shear Works Co., 3917 St. Clair Ave., Cleveland, O.
Hinman, D. A., & Co., Sandwich, Ill.
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Long & Allstatter Co., Hamilton, O.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

Blue Chip

High Speed Steel

No change in name in 25 years of good service, but constantly improved by metallurgical progress

FIRTH-STERLING SPECIAL

The Tool and Die Steel of *broad adaptability*

FIRTH-STERLING

S-LESS

STAINLESS STEEL

S-LESS A S-LESS B S-LESS M S-LESS T

A type for each purpose requiring corrosion-resistance
We were the first in America to produce Stainless Steel

OTHER TOOL AND ALLOY STEELS FOR SPECIAL PURPOSES

FIRTH-STERLING STEEL COMPANY

MAKERS OF FINE STEELS

McKeesport, Pa.

NEW YORK	BOSTON	HARTFORD
PHILADELPHIA	CHICAGO	CLEVELAND
DETROIT	SAN FRANCISCO	LOS ANGELES

National Steel and Machine Tool Exposition, Detroit, Sept. 19-23, Spaces 422 and 424.

M-22

WEST STEEL
QUALITY SERVICE

—BETTER STEEL CASTINGS—

WEST-75 HY-CAST STEEL is distinctly superior where performance under unusual conditions demands resistance to corrosion and a wide margin of safety under tremendous pressure. West-75 Hy-Cast Steel is suitable for high pressure valves, elbows and fittings.

—⊡—

West specializes on light steel castings in production quantities. Send us your blue prints and specifications.

West 60—Stancast

Tensile Strength 60,000 lbs. Elastic Limit 35,000 lbs. For Boiler Fittings, Electric Railway Car Castings, Pump Casings, Gears and Gear Housings, Mining and Road Machinery, Hubs and Wheels.

West 75—Hy-Cast

Tensile Strength 75,000 lbs. Elastic Limit 42,000 lbs. Especially adaptable for Accumulator Cylinders, Anvil Blocks, Car Wheels, Crank Shafts, Gears, Machine Tool Parts and all places where toughness and strength are important.

West 90—Duracast

Tensile Strength 90,000 lbs. Elastic Limit 55,000 lbs. For Brake Wheels and Drums, Gear Clutch Jaws, Hydraulic Fittings, High Pressure Valve Housings and all parts subjected to shocks and high pressure. "Duracast" possesses tremendous strength and high ductility.

West 110—Supercast

Tensile Strength 110,000 lbs. Elastic Limit 80,000 lbs. Where unusual conditions demand unusual castings "Supercast" meets the need! Die Blocks, Gyratory and Stamp Crusher parts, Digger Teeth, Bucket Lips and all parts subject to extraordinary abrasive action and abuse.

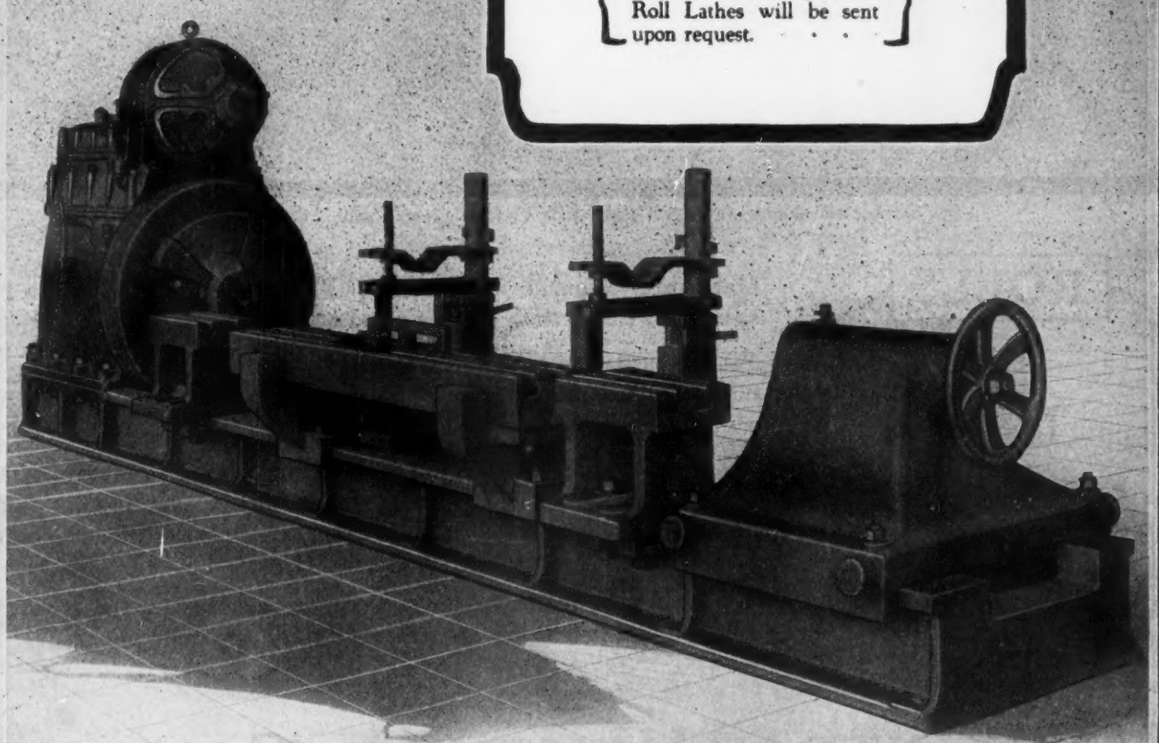
We solicit your inquiries

THE WEST STEEL CASTING CO.
Cleveland, Ohio

Mesta

MESTA Roll Lathes are of extra-heavy construction, assuring quietness of operation and freedom from vibration under heavy loads. The design of the headstock and the arrangement of the reduction gearing permits a wide range of speeds and easy control of operation.

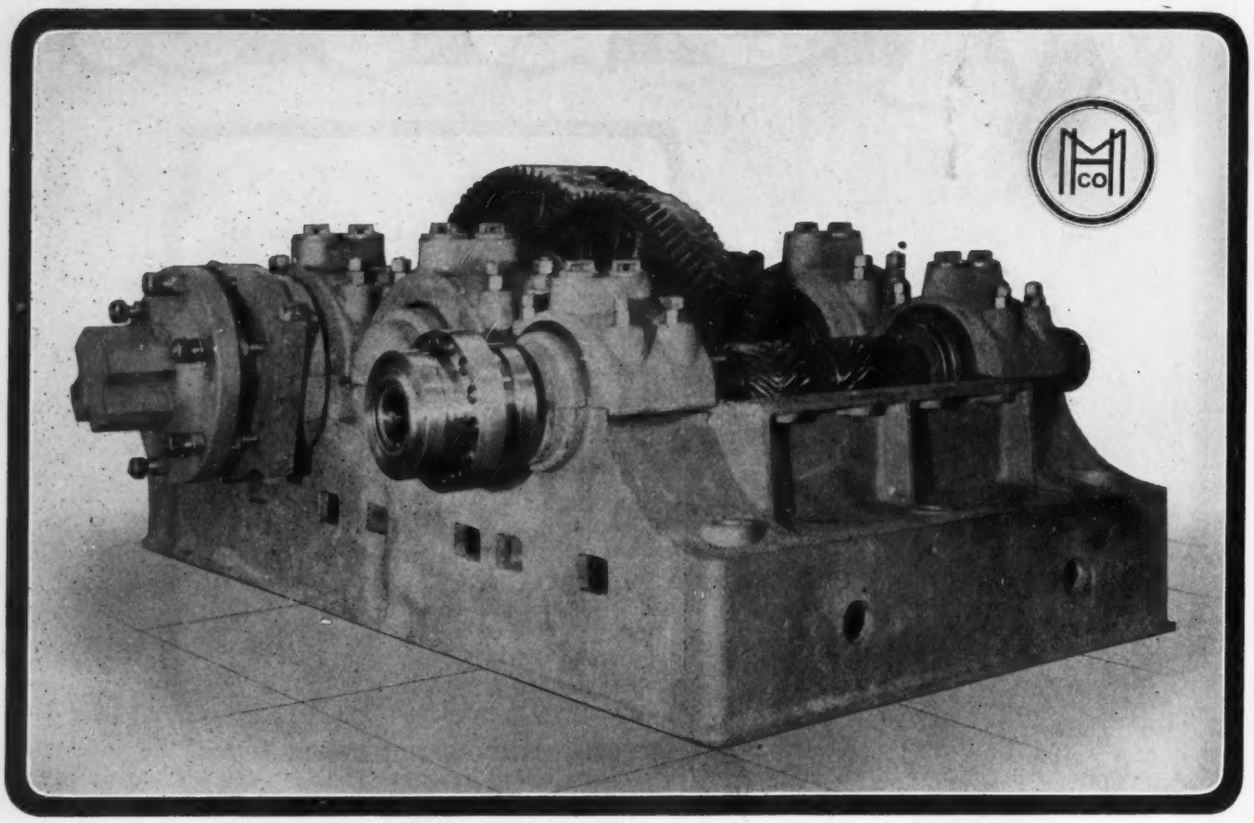
Our Bulletin "F" illustrating and describing Mesta Roll Lathes will be sent upon request.



Mesta Machine Company,
Pittsburgh, Pa., U. S. A.

MACKINTOSH-HEMPHILL

"The Best in Rolling Mill Machinery"



250 horsepower double reduction gear drive for 4-high cold mill. Cover removed.

ROLLS

Steel
Adamite
Manganite
Alloy Steel

Sand Iron
Chilled Iron
Chilled Adamite
M-H Special Grain
M-H Special Chilled

Mackintosh-Hemphill HERRINGBONE GEARS are unequaled for strength, wear, smooth operation and noiseless economy.

They are cut with any desired helical angle, continuous-tooth type, with the tooth apex of solid metal. In addition, the PINIONS are reinforced with integral shrouds.

We offer standard GEAR DRIVES in all sizes from 75 to 5000 H. P. in either single or double-reduction sets. But our success with difficult drives is particularly due to the special selection, design and construction which we apply to each different duty.

We also specialize in spur, bevel, worm and spiral gears and drives, gear cutting work, helical and straight-tooth racks, and mill pinions.

MACKINTOSH-HEMPHILL COMPANY

PIONEERS—ENGINEERS—BUILDERS

Established 1803 at Pittsburgh

Fort Pitt Foundry | A. Garrison Foundry | Pittsburgh Iron & Steel Foundry | Woodard Machine Co.

The Purest Commercial Iron Known to Metallurgical Science

Ingot Iron

This triangle is assurance that products bearing it are made with the skill, intelligence and fidelity associated with the name "ARMCO" and hence can be depended upon to possess in the highest degree the merits claimed for them

NEARLY a quarter of a century ago, ARMCO Ingot Iron was developed as an entirely new contribution to the metallurgical world.

ARMCO Ingot Iron must conform to the ARMCO standard of purity—a standard guarded by a staff of chemists and metallurgists. They, alone, tell the furnace men when the iron may be tapped from the furnaces, and whether it merits the ARMCO stamp of approval—the ARMCO triangle.

Whether doing service as a culvert under the world's railways or highways, as a refrigerator in San Juan, Texas, a range in a presidential mansion, as roofing and siding in tropical Panama, as caskets and grave vaults in American cemeteries, ARMCO Ingot Iron is the same pure iron base with a single standard of purity.

Just as it has always been ARMCO's ideal to produce "the purest iron made," so has it always been ARMCO's ideal of service to give its customers sheet metal with the different surface finishes, coatings, and treatments that conform to the use of the product.

ARMCO pure iron sheets are furnished in black, blue annealed, pickled and cold rolled, galvanized, alloy coated (lead and tin) or polished finishes, each as best suited for its intended usage. In all these different finishes, the same standard of purity of the base metal is rigidly adhered to.

Let our service engineers work with you in developing special pure iron sheets for your most exacting requirements.

THE AMERICAN ROLLING MILL COMPANY

EXECUTIVE OFFICES: MIDDLETOWN, OHIO

Export: The ARMCO International Corp.
Cable Address: ARMCO, Middletown

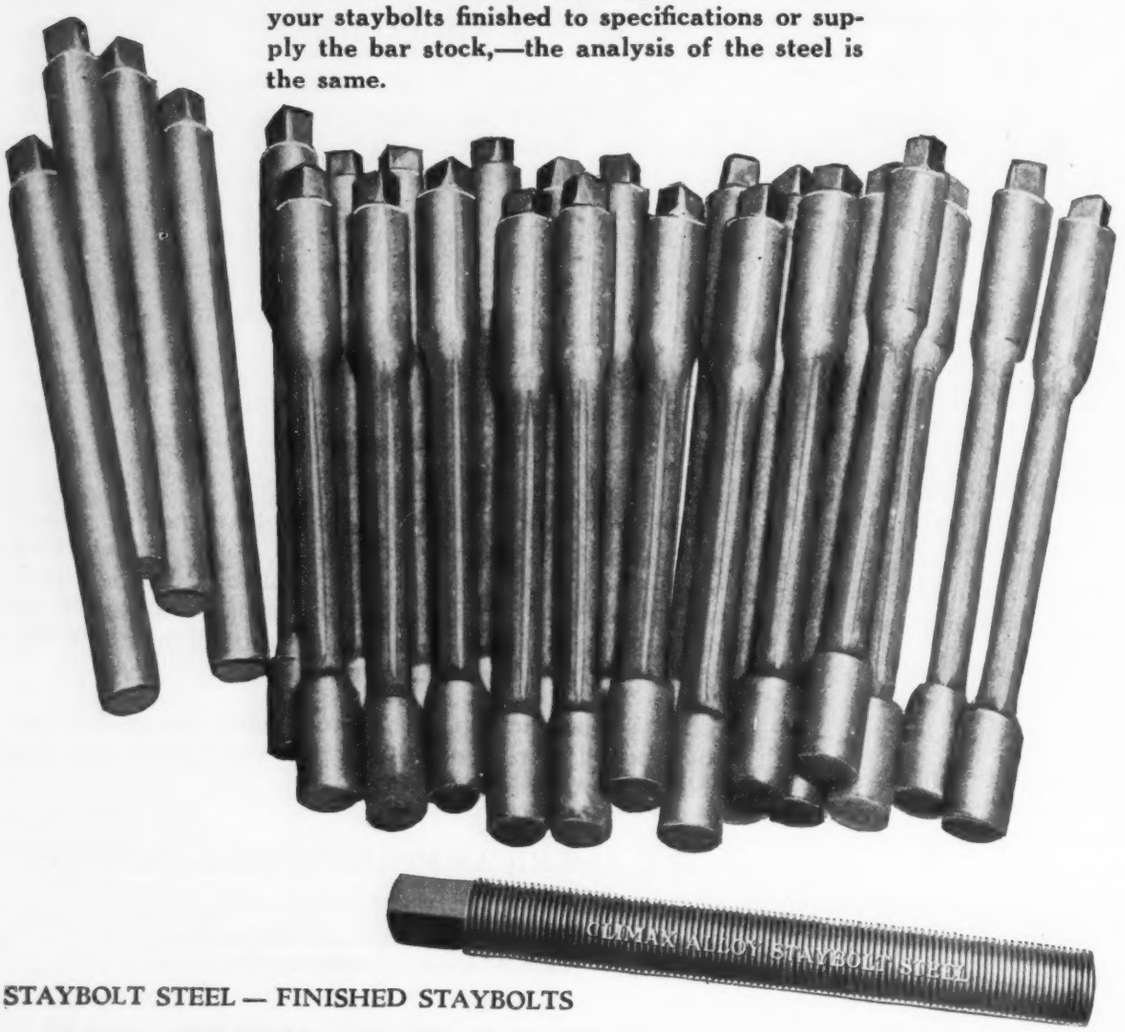
ARMCO TRADE MARK **INGOT IRON**
The Purest Iron Made

CLIMAX ALLOY STEEL

STAY-BOLTS

THE FOE OF VIBRATION AND CORROSION

EVERY essential staybolt requirement has been anticipated and provided for in "Climax Alloy Staybolt Steel." Its high resistance to corrosion, vibration and wear assure exceedingly long life, cut replacements to a minimum and reduce this important item of maintenance cost to the lowest possible figure We make your staybolts finished to specifications or supply the bar stock,—the analysis of the steel is the same.

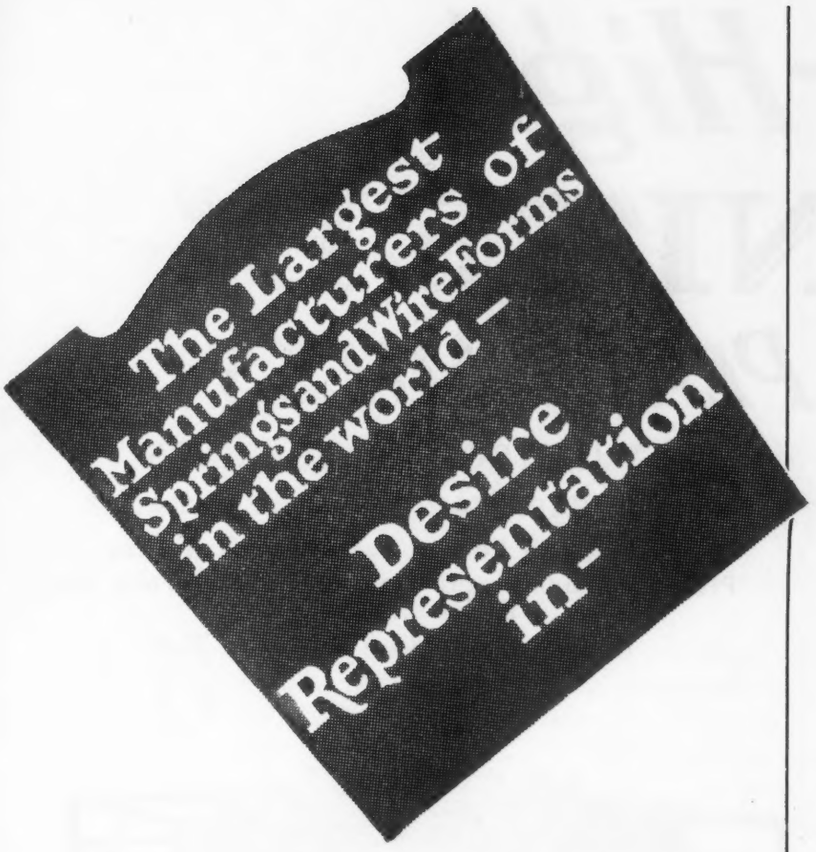


STAYBOLT STEEL — FINISHED STAYBOLTS

THE BOURNE-FULLER CO.

CLEVELAND, OHIO

Makers of "Upson Bolts"- The Result of Over 70 Years Specialization



WE manufacture 75% of the automobile cushion springs used in the United States as well as a complete line of mechanical springs, wire forms, and diversified wire products. We have ten plants throughout the country, from which we can make prompt deliveries.

In our effort to serve the metalworking industry still better, and to maintain our leadership in the production of diversified wire products, we are desirous of increasing our force of representatives. To this end we offer an attractive territorial proposition to organizations or individuals in cities listed on right.

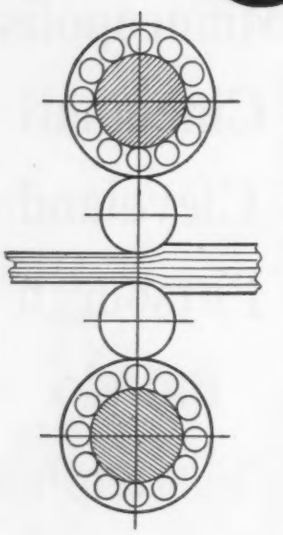
For full details write to Mr. William A. Falls, General Manager, 9200 Russel St., Detroit, Michigan.

Minneapolis
Cincinnati
Cleveland
Pittsburgh
Buffalo
Philadelphia
Atlanta
St. Louis
Boston
New York City
Kansas City

L. A. Young Industries, Inc.

Detroit, Mich.

4-High "UNITED" PLATE MILLS



WITH ROLLER BEARINGS

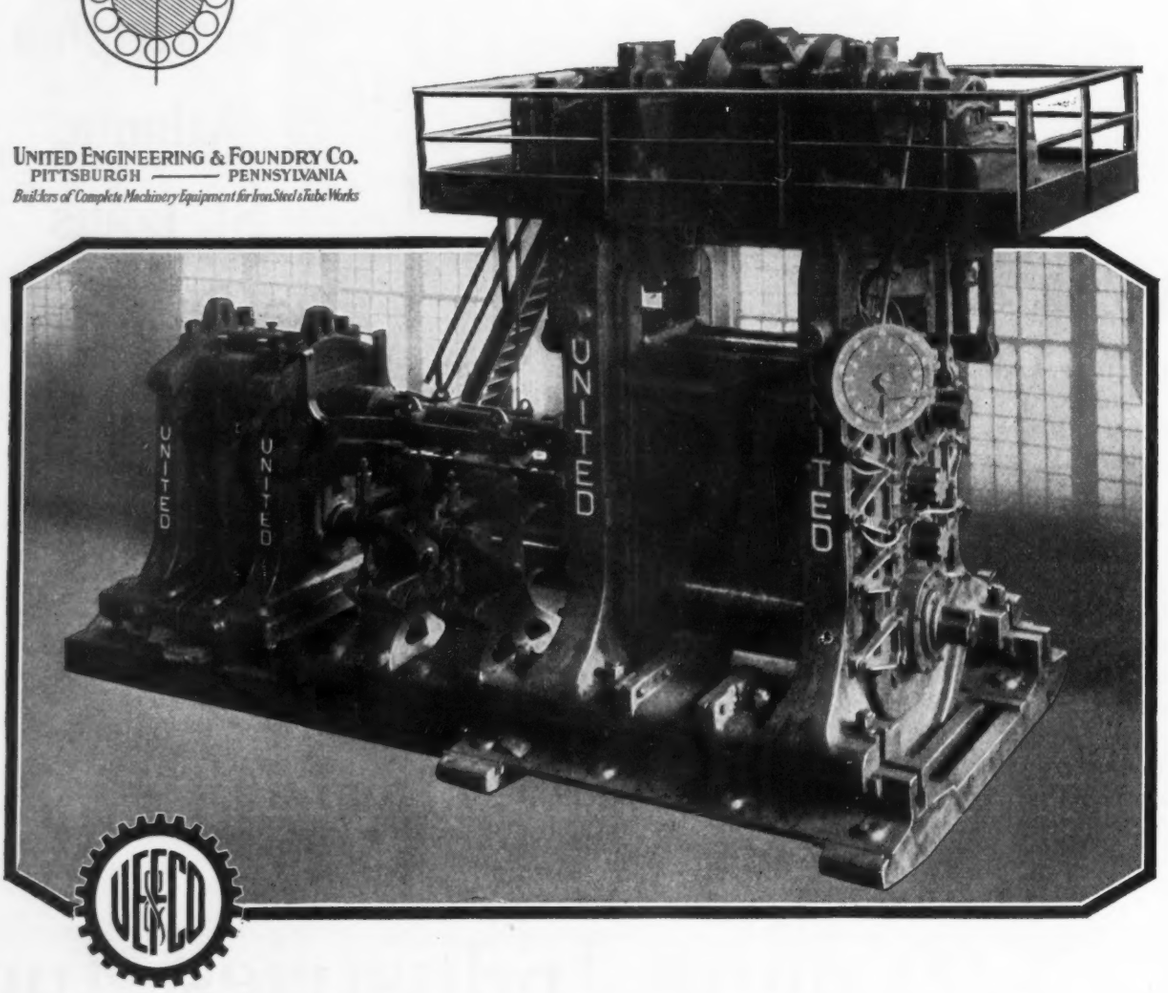
HAVE FAR REACHING ADVANTAGES

Reduce the Power Required for Rolling

Plates Accurate and True to Gage Across and From End to End

Reduce Production Cost Per Ton

UNITED ENGINEERING & FOUNDRY CO.
PITTSBURGH —— PENNSYLVANIA
Builders of Complete Machinery Equipment for Iron, Steel & Tube Works



84-inch 4-High Plate Mill with Roller Bearings—Built for Lukens Steel Co.

The Largest Plate Mill in the World equipped with Roller Bearings

Behind Them, the Yesterday of Dreams ~ AHEAD, the Will to Do

DAWN . . . and the first scintillating rays of a returning sun find a lonely prairie schooner trekking westward.

No blare of trumpets heralded this departure. No clamorous populace shouted "Godspeed" and waved their kerchiefs until the last dim shadow melted into an ever-beckoning horizon.

All was quiet save the rhythmic crunch, crunch, crunch of wheel against earth, and the intermittent "Giddap" of an eager driver to his team.

Now, a joyful wood thrush in a nearby thicket ceased his morning warble of greeting to scan this audacious stranger who had disturbed his peace. Farther on a copper-skinned denizen of the wilderness peered immobile for a moment and then faded away into the forest like some elusive spirit.

Came days of toil, privation, and hope deferred. Tortuous trails, deep and treacherous streams, impassable underbrush—trail-blazing! Nights mid torrential downpours when flint met steel in vain. Long watches, and the ever-present fear of marauding savages and beasts of prey.

No strength in numbers here. Still, indefatigably they pitted their puny efforts against the vast wastes raised up against them—with westward! ever westward! their challenge.

Then, the plains . . . boundless stretches of withered grass as far as eye could reach. And ere long, barren deserts cradled between foothills of huge giants who seemed to sense the impending struggle between their enduring rock and these frail mortals.

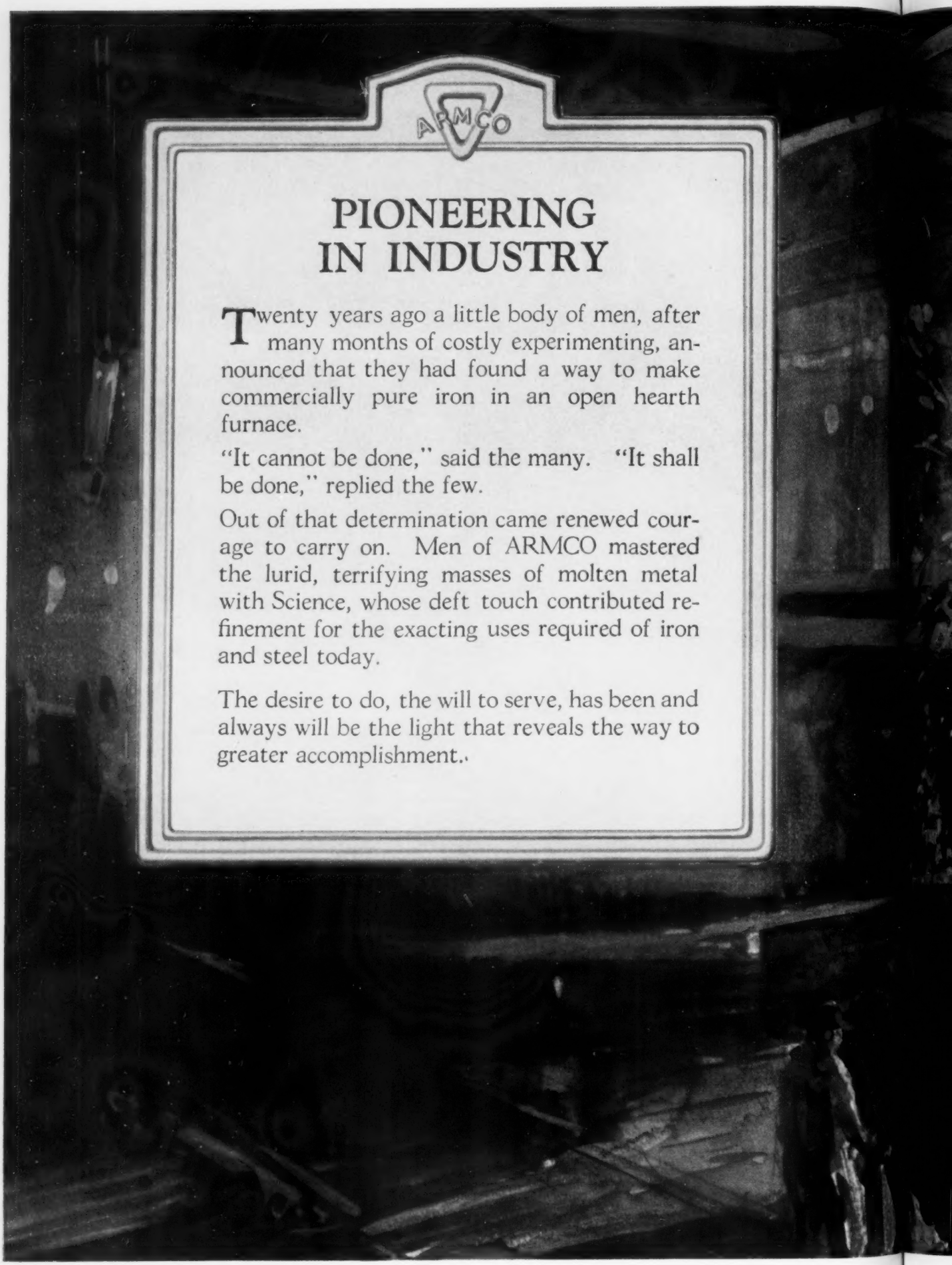
Now, the supreme test . . . mountain passes in the dead of winter . . . devious pathways . . . yawning chasms.

Finally the top . . . the outlook . . . the descent . . . and then—A New Home!

Conquest, this was, such as man had never before recorded on his tablet of epics. Memorable achievement which was to pave the way for still greater triumphs in the western world.

Hardly a century later another little group of trail-blazers at Middletown, Ohio, set out in quest of new things. This time it was in the impenetrable wilderness of iron and steel metallurgy. All that was ARMCO was in that fragile schooner and the indomitable pioneering spirit was their challenge to the hazards of an unbeaten path.

Here, again, a new "West" was won. Science and metallurgy met triumphant in the roseate dawn of a new iron era. And the hardships incurred lifted the curtain of progress to new and ever widening possibilities in the great iron and steel industry.



PIONEERING IN INDUSTRY

Twenty years ago a little body of men, after many months of costly experimenting, announced that they had found a way to make commercially pure iron in an open hearth furnace.

"It cannot be done," said the many. "It shall be done," replied the few.

Out of that determination came renewed courage to carry on. Men of ARMCO mastered the lurid, terrifying masses of molten metal with Science, whose deft touch contributed refinement for the exacting uses required of iron and steel today.

The desire to do, the will to serve, has been and always will be the light that reveals the way to greater accomplishment..

OUTSTANDING SERVICE

1. Electrical Steel Sheets

The utilization of electricity brought its problems to the iron and steel industry. Then it was that ARMCO developed a special analysis steel sheet for electrical uses. Today, after more than a quarter of a century of experimenting, developing, and perfecting, these products are filling the exacting needs of leading manufacturers of electrical equipment, the world over.

2. High Finish Sheets

New methods of transportation have veritably put the world on wheels. In 1912, when the automotive industry was yet an infant, ARMCO brought forth an extremely versatile sheet, one that found no precedent for general auto body purposes. And from that day on, ARMCO has worked with this enormous industry, anticipating its needs, and developing, from year to year, special analysis sheets that have played an important part in its phenomenal growth.

3. Pure Iron

The universal use of iron and steel has brought its problem—rust. Centuries ago the durable qualities of pure iron were known. Its universal use was prohibited, however, because it could not be made in commercial quantities. Then ARMCO pioneered and gave to the world "the purest iron made." Thus, by finding a way to practically eliminate the impurities that stimulate rust and corrosion, ARMCO added another chapter to its history of developments.

4. Enameling Iron

The growth of the porcelain enameling industry is inseparably linked with the development of pure iron. For iron here must be consistently uniform, degasified, and at the same time possess a smooth but velvety-like surface—if it is to produce glossy porcelain ware without blemishes, and lower the enameler's operating cost. ARMCO Ingot Iron, because it consistently fulfills every requirement, is the most widely used sheet metal for porcelain enameled products.

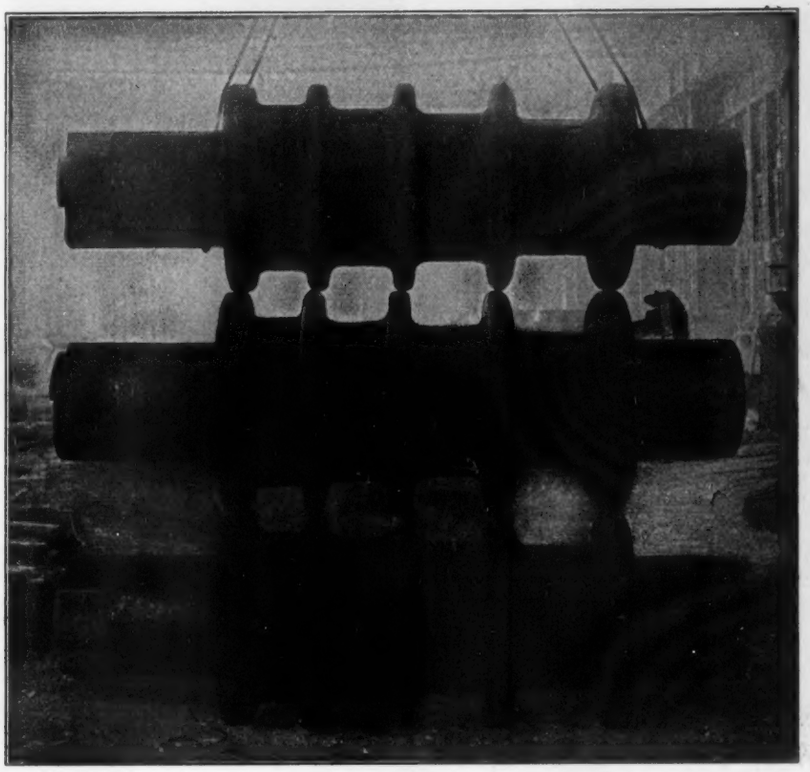
THE AMERICAN ROLLING MILL COMPANY
MIDDLETOWN, OHIO

Export: The ARMCO International Corp.
Cable Address: - - - ARMCO, Middletown

DISTRIBUTORS IN ALL THE PRINCIPAL CITIES OF THE WORLD

WHEELING
QUALITY CASTINGS

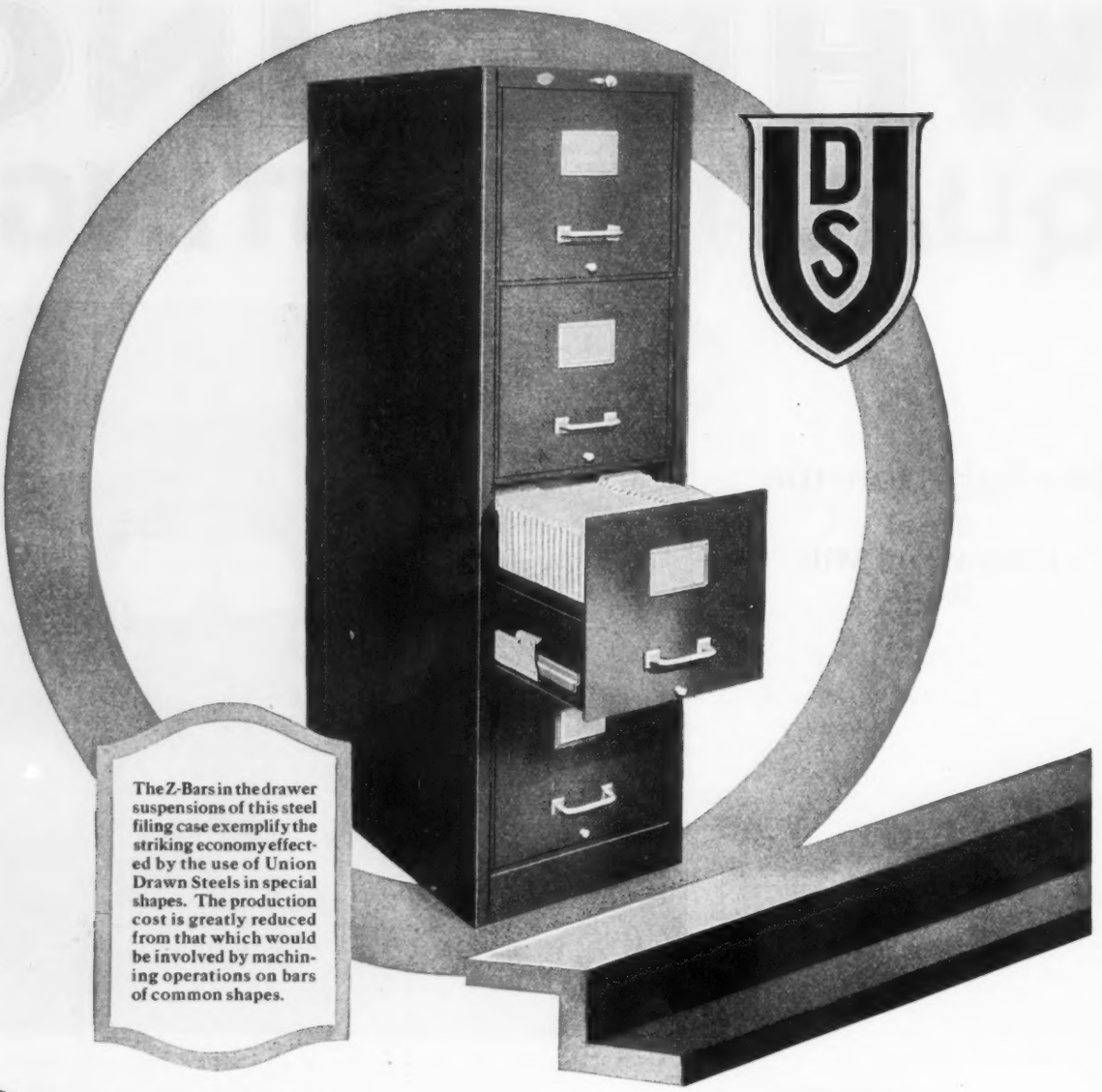
Mo-lyb-den-um
Steel
Blooming Mill
Rolls



WHEELING QUALITY
STEEL ROLLS
SUPER-STEEL ROLLS
CHILLED ROLLS
SAND ROLLS
Mo-lyb-den-um
ROLLS
STEEL AND IRON CASTINGS
ROLLING MILL MACHINERY
SPECIAL MACHINERY

Blooming Mills
Bar Mills
Sheet & Tin Mills
Shears
Roll Lathes
Mill Tables

WHEELING MOLD & FOUNDRY CO.
WHEELING, W. VA.

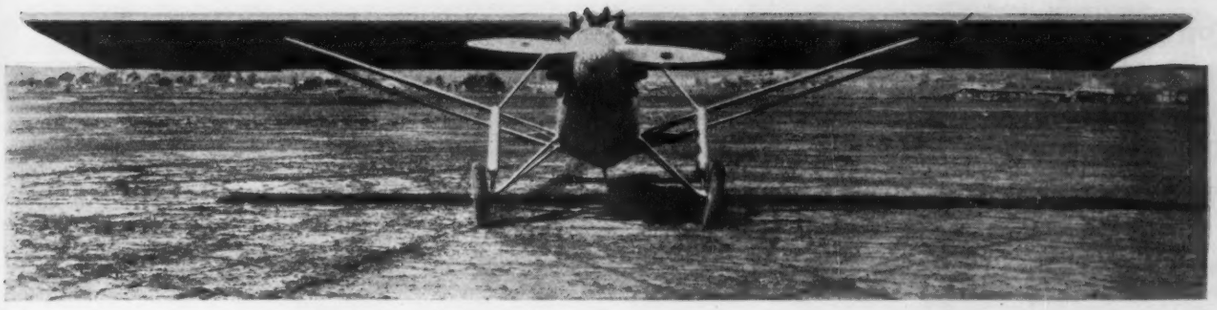


The Z-Bars in the drawer suspensions of this steel filing case exemplify the striking economy effected by the use of Union Drawn Steels in special shapes. The production cost is greatly reduced from that which would be involved by machining operations on bars of common shapes.

Many manufacturers frequently adopt Union Drawn Steel Bars of special shapes in order to reduce operating costs, simplify production *and* accomplish improvements

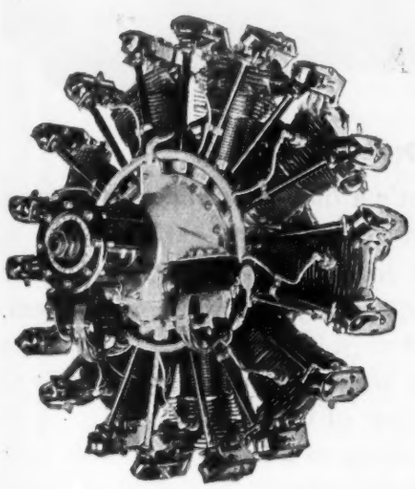
UNION DRAWN STEEL CO. *Beaver Falls, Pa.*

UNION DRAWN STEELS



You will recall that WRIGHT WHIRLWIND engines carried both Captain Lindbergh and Pilot Chamberlin safely to Europe in non-stop flights from New York.

It will be interesting to you to know that all of the furnaces and ovens used for heat treating and processing various parts of our WRIGHT WHIRLWIND engines were made by the American Gas Furnace Company. We are proud to share with them the credit for the high quality maintained in the WRIGHT WHIRLWIND engine.



Very truly yours,

WRIGHT AERONAUTICAL CORPORATION

J. T. Harrison

Where dependability is paramount
use an "American"

AMERICAN GAS FURNACE CO.

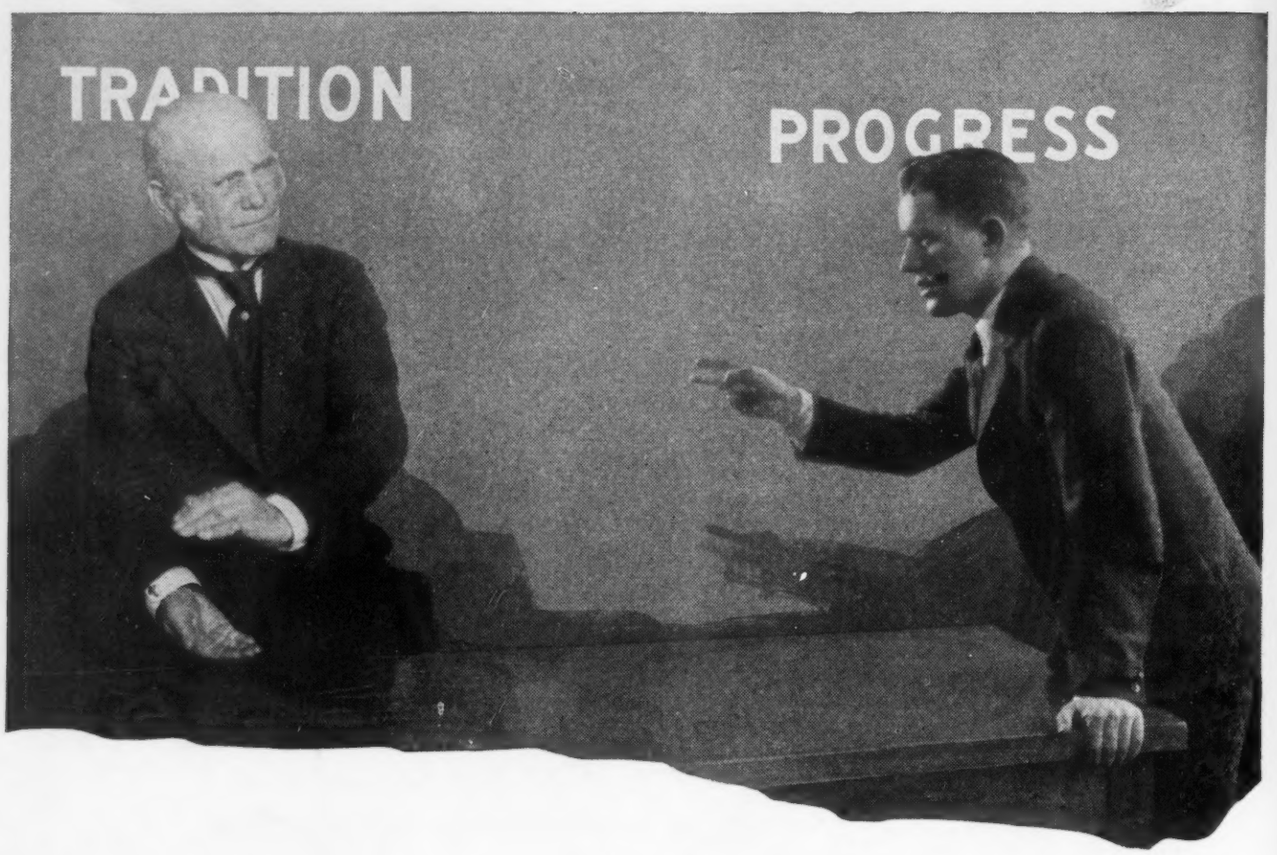
Main Office and Works: Elizabeth, N. J.

AMERICAN GAS FURNACE CO. — PIONEERS IN 1878 — LEADERS TO-DAY

We Make

Automatic Heat Controllers
Automatic Quenching Tanks
Blowers
Blowpipes or Blowtorches, Hand and Sand
Boosters, Gas
Brass Melters
Brazing Furnaces and Tables
Burners
Burners for Electric Lamp Bulb Manufacture
Carbonizing Machines
Cyanide Furnaces
Cylindrical Furnaces
Forges
Forges, Glass Bending
Hardening Hammers
Heating Machines
Melting Furnaces
Muffle Furnaces
Oil-Tempering Furnaces
Oven Furnaces
Plating Furnaces
Rivet Heaters
Soft Metal and Lead Hardening Furnaces
Soldering Iron Heaters
Sweep Reducing Furnaces
Tempering Plates
Tire Heaters
Tube-Heating Furnaces
Every Type of Gas Blast Burner, Furnace and Heating Machine for Industrial Uses

Pop Made it Unanimous



Listen, Lad—

You say I never give you a fair hearing about changing our design so as to abolish cast iron and riveted construction on our equipment We just had a board of directors' meeting and I brought up your suggestions. We all acted *AS ONE MAN* in turning it down.

Yes, Pop—

and that's a *liberal estimate* considering that eight men were present.

You wouldn't hire a salesman to sell your goods if he had spent years in damning them, and yet you attempt to sell an idea that you're against and on which you don't even study—much less the rest of the board.

Those directors sitting on a half dozen boards can't be blamed for nursing along the business on old lines—they look to you for the vision necessary to keep abreast of the times.

I see that now the scientists say that the ostrich doesn't bury his head as reported — that leaves only you in this class.

A new textbook on Arc Welding (Price $1.50) will be sent on approval for five days to any executive requesting it.

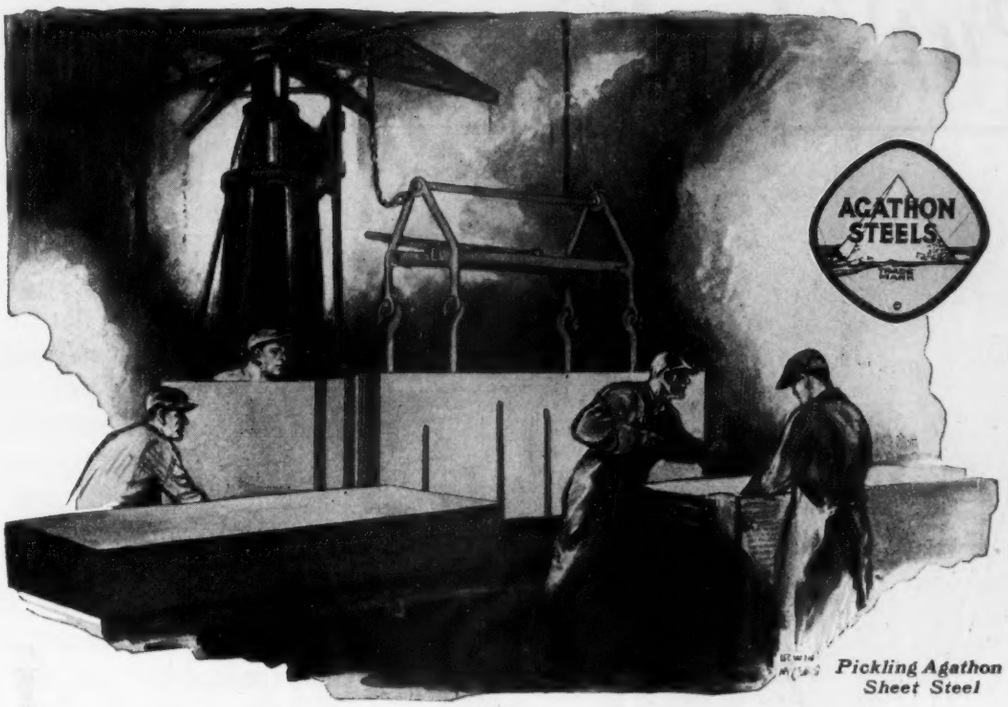
Book size, 6" x 9"—total pages, 160—number of illustrations, 200—Charts, 62—Divisions, 8.

The Lincoln Electric Co., Dept. No. 20-6, Cleveland, Ohio

WC-16

"Stable Arc"

LINCOLN WELDER



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Special Finish Sheets of Unsurpassed Quality

EVEN the pickling of Agathon Sheet Steel is conducted with the same degree of care that characterizes every step of our production. Not only is every sheet thoroughly freed from scale in the pickling tanks, but also brush scrubbed by special machinery and promptly dried by warm-air blasts. No wonder Agathon special finish sheets have found such great favor with builders of motor car bodies, metal furniture, etc. No matter how exacting your requirements may be, Agathon sheets will meet them. Write us.

Use Agathon Sheet Steel for

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Cowls
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Central Alloy Steel Corporation, Massillon, Ohio

Makers of Toncan Copper Mo-lyb-den-um Iron

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AGATHON SHEET STEEL

Put the Rivers to Work

Write for this Complimentary Book

Address Advertising Department:
JONES & LAUGHLIN STEEL CORPORATION
Jones & Laughlin Building
PITTSBURGH, PA.

PLEASE INDICATE WHAT PROJECTS YOU ARE PLANNING THAT INVOLVE THE USE OF STEEL PIPE OR OTHER STEEL PRODUCTS.

"OUR RUNAWAY RIVERS" is a 52-page book with 60 photo illustrations, giving a comprehensive visual idea of the extent to which American Industry is already putting to work our 9,000-mile system of inland waterways for distribution of the products of mill, mine, farm and factory in conjunction, not in competition, with our national system of railways. It is a book in which you will be intensely interested.

FLOODS in the Mississippi Valley disastrous beyond anything in its history have served to call sharply to the attention of the nation the necessity for compelling our rivers to cease being our masters and become our servants. The irreparable losses sustained by the courageous people in the flooded areas have awakened the sympathy of the entire country. There is a spirit of determination in the land that our runaway rivers must be obliged to stay within bounds and go to work furnishing transportation, power and light.

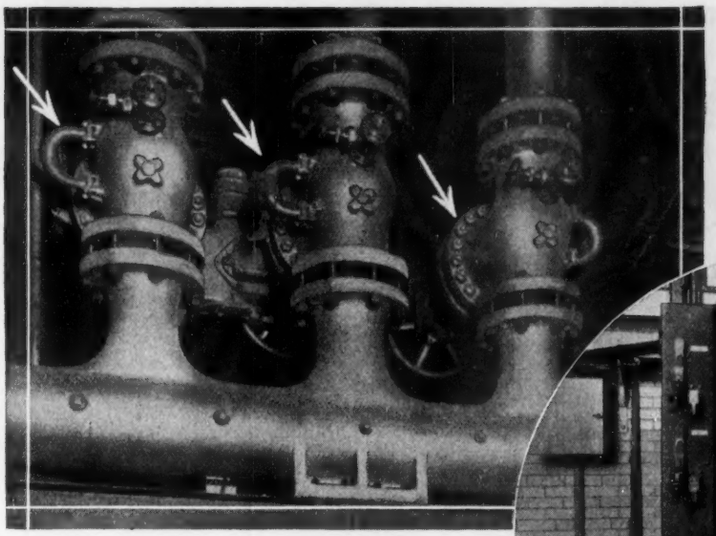
Already the steel and oil industries have pointed a way to use of the rivers for delivery of manufactured products. The federal government is operating a common carrier barge service and private carrier lines are beginning to spring up. The whole story of this recent and rapid development is told pictorially in the book shown herewith, which the Jones & Laughlin Steel Corporation is distributing to everyone interested.

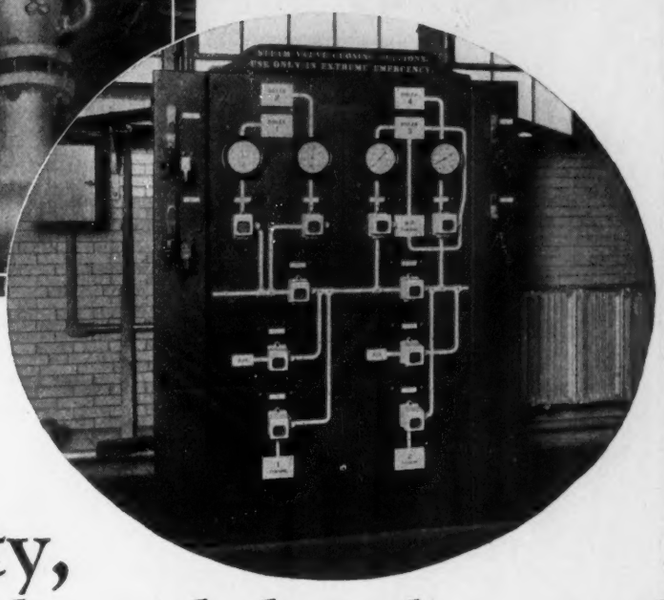
JONES & LAUGHLIN STEEL CORPORATION

American Iron and Steel Works

PITTSBURGH, PA.

C-H VALVE CONTROL





With the constant increase of steam pressures in modern plants, safe, remote valve control has become a necessity. C-H equipped valves are operated from a control unit, located far from danger. Control units may be mounted separately or on a panel as shown.

~gives flexibility, safety · *impossible with hand control*

YOU know the value of organization — the centralization of control and authority—but have you considered its advantages when applied to valve control?

The C-H Valve Control System makes every valve instantly responsive to the touch of a button. Sequences of valve operation are followed automatically—in a fraction of the time required by hand. Plant flexibility and efficiency are increased with accompanying savings in labor and costs.

In addition, C-H Dean Valve Control protects your plant. Equipment can be "fool-proofed" by interlocking arrangements. Control stations for emergency use can be located in another room or building—far from danger. Protection is always certain, for an unseating blow starts sticky valves and operation is accurate to a hairline—regardless of pressures or velocities.

Even though your plant is already operating, C-H Valve Control can be installed—nearly always without shutting down a line.

Quick change-over on the air-blast

Should a blower fail, minutes count. With C-H Valve Control the "stand-by" blower can be "cut-in" so quickly that the furnace crew won't realize the shift has been made. And by electrically interlocking the feed and discharge valves change-overs are affected almost automatically, and with less chance of error.

With increased flexibility, efficiency and safety assured, is not C-H Valve Control the next logical improvement in your plant? Write for the booklet "Modern Valve Control Practice" which gives complete information

The CUTLER-HAMMER Mfg. Co.
Pioneer Manufacturers of Electric Control Apparatus
1225 St. Paul Avenue
MILWAUKEE, WISCONSIN

CUTLER C-H HAMMER

Dean Valve Control System

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PATENTED

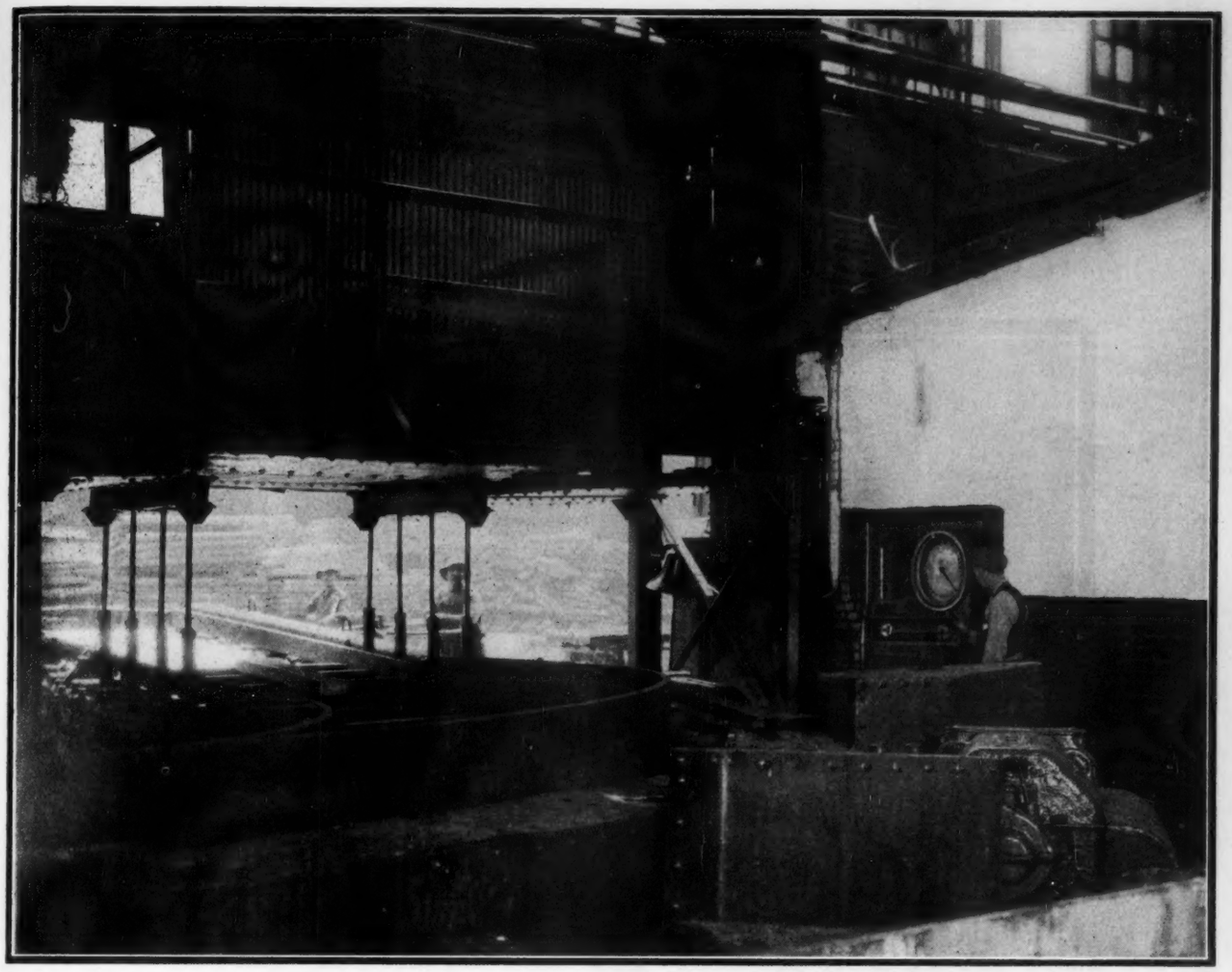
ROLLS

ADAMITE IS BEING USED EXTENSIVELY FOR HORIZONTAL ROLLS IN UNIVERSAL MILLS FOR WORK ON WHICH A HIGH FINISH IS NOT REQUIRED. IT IS GIVING EXCEPTIONAL TONNAGES.

SPECIFY ADAMITE

ADAMITE ROLLS AND HEAVY DUTY CASTINGS

Sole Manufacturers { Mackintosh-Hemphill Co. / United Engineering & Foundry Co. } *Pittsburgh, Pa.*



Weigh it as it goes by—Typifying many applications of Fairbanks industrial dial scales, providing a check on materials without interrupting continuity in the flow of production.

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Build your scheme of weighing right into your production system. With modern Fairbanks Dial Scales, you can bring to every weighing operation the same efficiency and speed you demand in other phases of production. Nearly a century in the scale industry and today better than ever equipped to serve industry, Fairbanks offers the most complete line of general and specialized weighing equipment. Ask us for a Fairbanks survey of your plant weighing needs. There is no obligation.

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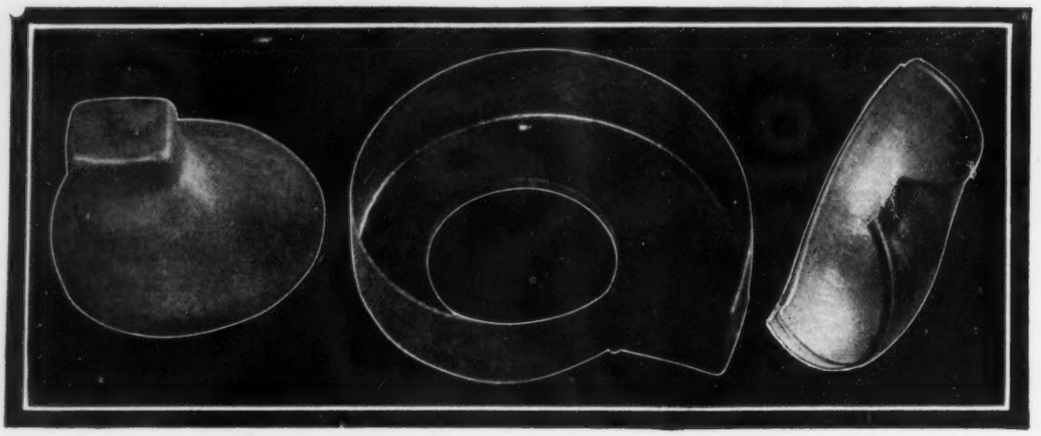
Such difficult Stampings as these



can be drawn *economically* only with the aid of Marquette Pneumatic Die Cushions.

Two of the deep, difficult, offset shapes you see above are being drawn *in one operation* on a single action press in the plant of the Nizer Corporation, Detroit, at the rate of fifteen shells a minute, using .037 auto body stock.

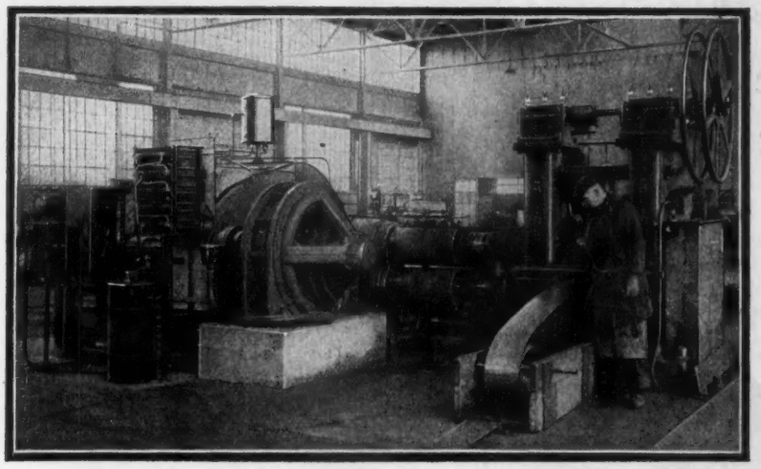
The other, an especially tricky job, could not be drawn at all using ordinary equipment, but they are able to produce it on a quantity production basis.

These remarkable examples of present day metal drawing were made possible by simply installing Marquette Air Cushions beneath an ordinary No. 57A Toledo press — it could have been *any* press; they first prevent the blanks from either wrinkling or tearing as the metal is being drawn into the die, then prevent the destructive backlash which often spoils finished shells.

Naturally, considering the savings effected and the increased speed of production secured, the Nizer people are glad they talked their problem over with our Engineers. And it might pay *you*.

Send sample shell (or blue print), brief description of your present equipment and methods used.

Marquette
TOOL & MFG. CO
CHICAGO
1908 No. Kilbourn Ave.



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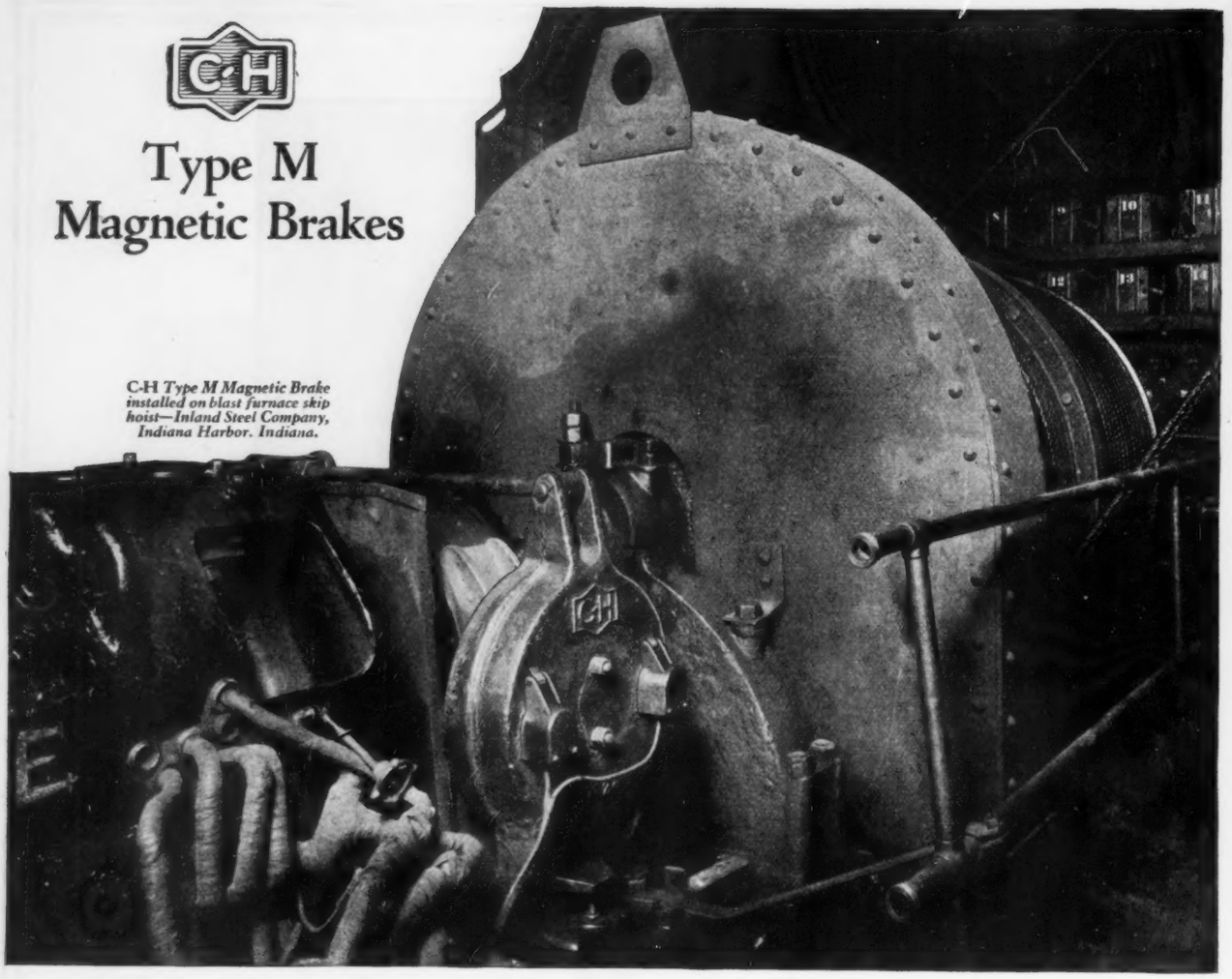
FOR STRIPS AND SHEETS

TWO HIGH TYPE
FOUR HIGH TYPE
CLUSTER TYPE

E. W. BLISS CO.
BROOKLYN, N.Y., U.S.A.

Type M Magnetic Brakes



C-H Type M Magnetic Brake installed on blast furnace skip hoist—Inland Steel Company, Indiana Harbor, Indiana.

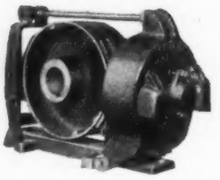
Safe, precision braking for the blast furnace skip-hoist

ON the blast furnace skip-hoist, stopping must be quick and certain.

Direct magnet action—short brake-shoe stroke—180° effective braking surface—these features of Type M Brakes assure that essential speed and reliability.

Why experiment? Many well known steel mills have done that for you already. Capitalize on their experience by installing C-H Type M Brakes on skip-hoists, draw benches, blooming mill screw-downs, charging machines or on any equipment where precision stopping is required.

It will pay any executive responsible for the efficiency and safety of equipment or men to get the complete story of C-H Type M Brakes.



Quick stops!

The brake-shoes on the C-H Type M Magnetic Brake, travel but a small fraction of an inch and clamp 180° of effective friction surface around the brake drum. Regardless of direction of travel, equipment is halted in minimum time. Such responsiveness is invaluable on the blooming mill screw-down or any equipment where exact register of movable parts must be maintained by the brake.

The CUTLER-HAMMER Mfg. Co.

Pioneer Manufacturers of Electric Control Apparatus

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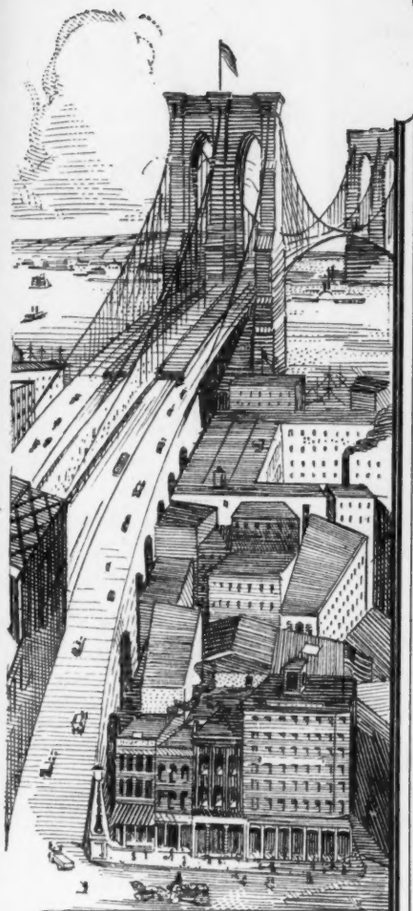
CUTLER C-H HAMMER

Industrial Efficiency Depends on Electrical Control

100 YEARS OF STEEL IMPROVEMENT

Number Four in a Series of Advertisements



Begun in 1870 and completed in 1883, the Brooklyn Bridge for many years attracted tourists from all over the world. With a span of 1595 feet and a total length of 6016 feet, it cost more to build than any other New York bridge.

BROOKLYN BRIDGE

WAS THE NEWEST OF THE WORLD'S WONDERS WHEN JOHN GAMGEE MADE THE FIRST AMERICAN NICKEL-IRON ALLOYS

THE first of the large suspension bridges was astounding the world with its beauty and length of span when John Gamgee made the first Nickel-Iron Alloys recorded in America.

Gamgee's name has been associated with efforts to stamp out yellow fever with refrigeration and low temperatures. But he must also be credited with advancing the development of Nickel Alloy Steels through his Connecticut experiments in 1883.

The many years of Nickel Steel development have contributed to an extensive fund of information concerning the superior properties and many uses of these Alloys. You are invited to consult our engineers, and thus draw upon these helpful data.

SOME STANDARD APPLICATIONS OF NICKEL ALLOY STEEL

Armor Plate	Ordnance
Axles	Railway Track Work
Boiler & Fire Box Plate	Roller Bearings
Boiler Tubes	Shafts
Bolts, Nuts, Rivets, etc.	Shovels
Castings	Special Tools
Crank Shafts	Steel Mill Rolls
Dies & Die Blocks	Structural Shapes
Forgings	Turbine Blading
Gears & Pinions	Valve Bodies
Mechanical Tubing	Welding Rod

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ALLOY STEEL

Send for Buyer's Guide for Nickel Alloy Steel Products

Nickel

FOR ALLOY STEEL

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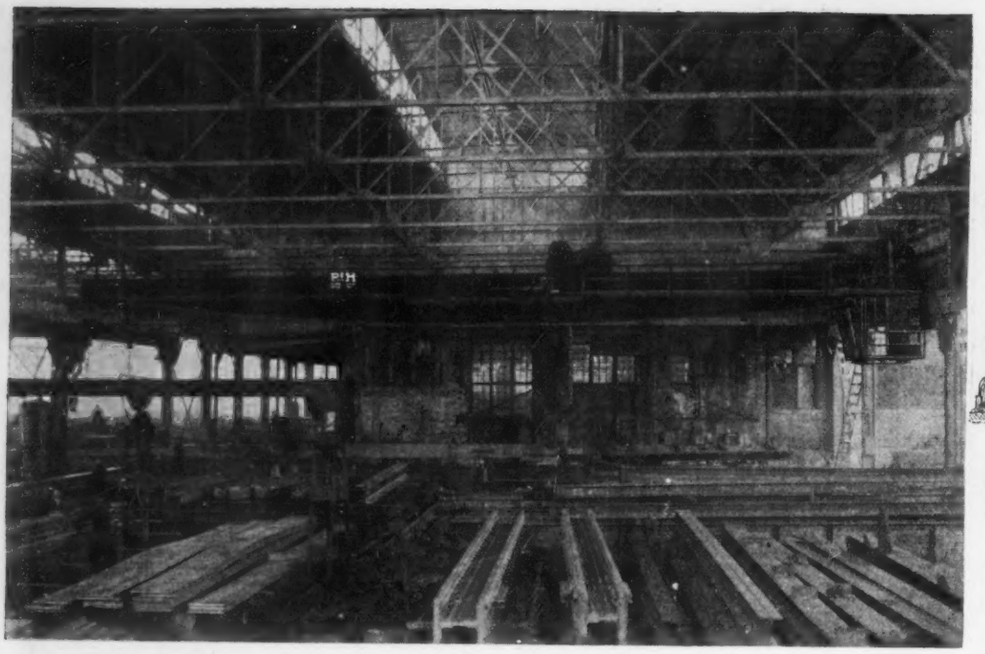
Producers of INCO Nickel in all commercial forms



In 1901—year of the Pan-American Exposition at Buffalo—a certain leading steel company bought their first P & H Crane. Today, this plant operates 93 P & H's—prefers them because of faultless performance.*

**Name of this Company given on request.*

One P & H in 1901—today 93

*4 P & H Cranes per year by one steel plant**

LET THE EXPERIENCE of such large users save your money in selecting cranes.

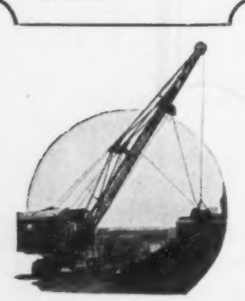
They have looked beyond the price tag—know that the design, material and workmanship of P & H Cranes guarantee long life—lowest cost per year of service.

In addition, P & H Cranes cut costs by speeding production. The operator has full view of the hook in any position—all materials are handled quicker. A P&H Crane pays for itself surprisingly soon.

Bulletin No. 408-R gives complete information on P & H Cranes. Write for a copy.

Features which make P & H Cranes superior

- *Accessibility of all parts.*
- *Durability through liberal design.*
- *All gears of steel.*
- *All trolley bearings are bronze-bushed.*
- *Through bolts are used throughout.*
- *Front lever control—operator has full view of hook in all positions.*
- *All safety requirements met.*
- *Built completely in P&H Shops—not merely assembled.*



P&H Gasoline Cranes

P & H Two-Speed Corduroy Cranes go anywhere—handle any materials cheaper and quicker than men. With unit cast steel construction and P & H quality throughout they cost less per year of service.

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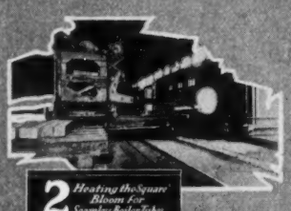
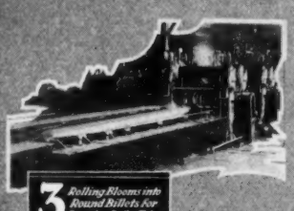
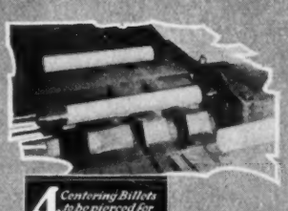
P&H CRANES and HOISTS

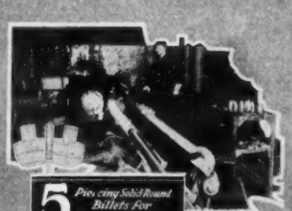
10 steps to Quality

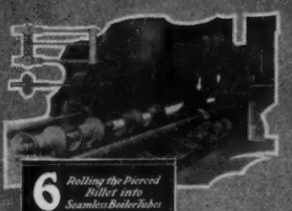
in making Boiler Tubes

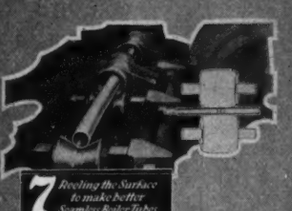


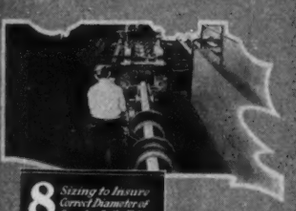


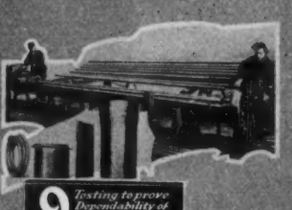


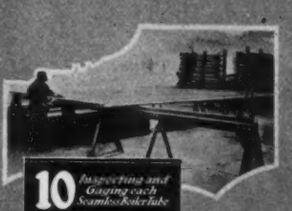












COMPLETE control from raw material to finished article, is one of the fundamentals upon which many of America's leading industrial organizations base the uniformly high quality of their product. It is upon this principle that National Tube Company relies in the manufacture of boiler tubes that will meet the rigid requirements of this modern Age of Power. The severe service conditions imposed upon boiler tubes today demand unvarying uniformity of materials and dimensions—and dependability in operation.

Beginning, therefore, with the mining of the ore, through the various steps in the manufacture of the steel into a large reserve stock of blooms, on through the subsequent manufacturing operations of piercing, rolling, finishing and testing, "NATIONAL-SHELBY" Boiler Tubes are subject to expert supervision and minute inspection. At each step in the process, the product must meet the high standards of materials and manufacture set by National Tube Company. The result is the continuous production of uniformly high quality boiler tubes.

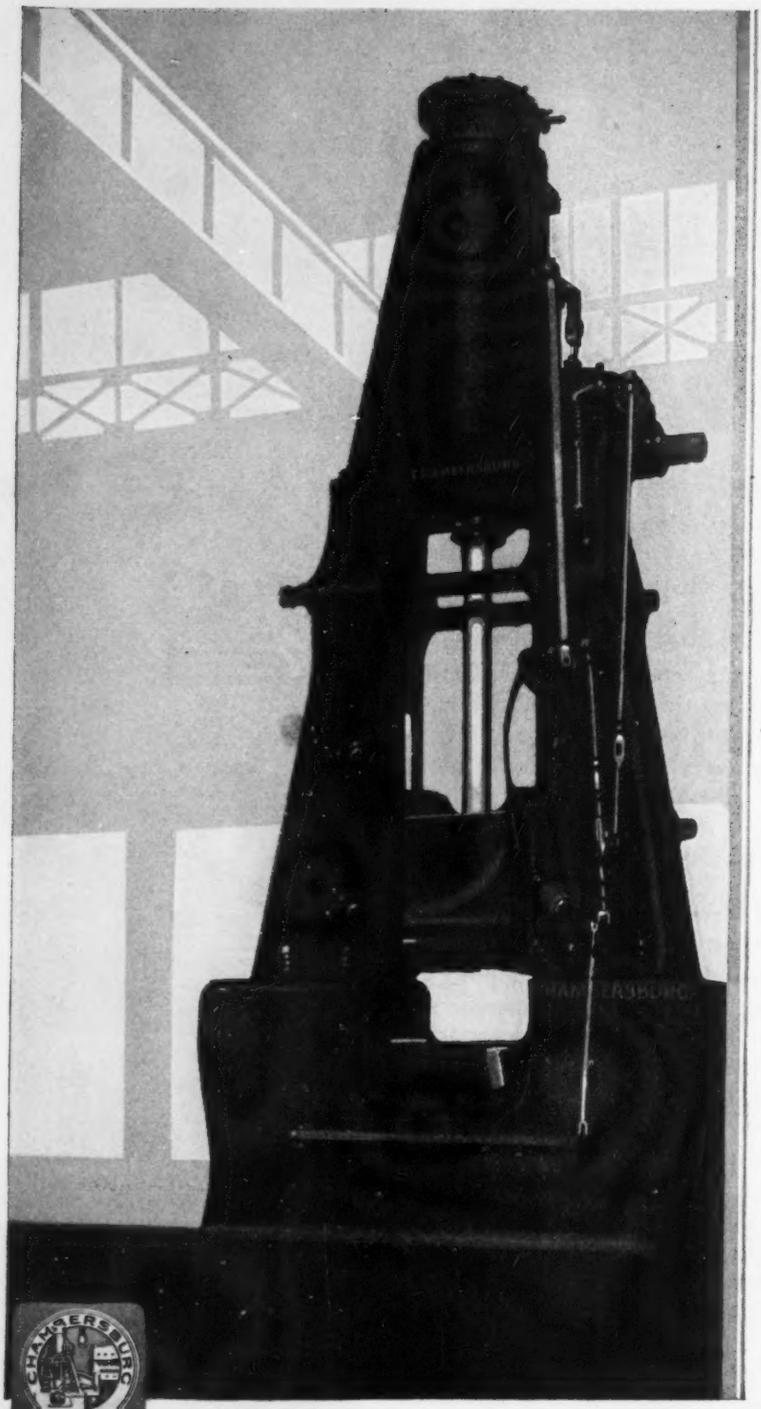
Send for your copy of Bulletin No. 12—Properties, Use and Manufacture of Seamless Hot Rolled Boiler Tubes

NATIONAL SEAMLESS BOILER TUBES

(SHELBY)

NATIONAL TUBE COMPANY, PITTSBURGH, PA.

District Sales Offices in The Larger Cities



How Would YOU Design this Hammer?

THE more you have had to do with forging work, the more certainly you work out certain "pet" ideas about hammer design.

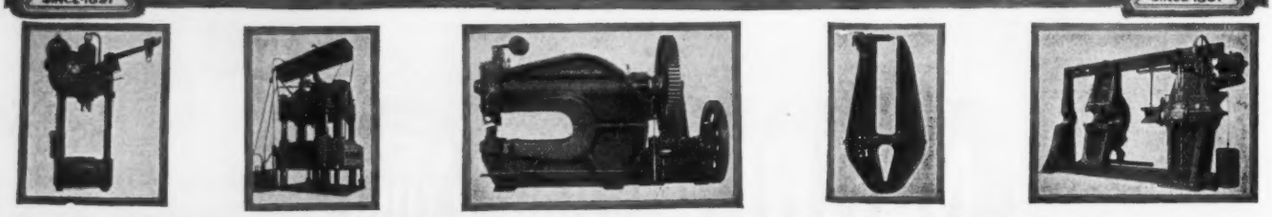
We would like you to compare Chambersburg design with your own ideas about hammers. Ten to one you'll find most of your "pets" anticipated and incorporated in our design.

Practical experience has been *our* teacher, too.

We have bulletins covering our complete line. Tell us what you are interested in.

CHAMBERSBURG ENGINEERING CO.

Chambersburg, Pa.
Detroit: Stephenson Bldg.



CHAMBERSBURG

The Empire New Process Bolt with threads that match the accuracy of gauge threads, and with its tensile strength up beyond 80,000 lbs. is worth a lot more money to you than any bolt you can buy. Yet the price remains the same

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Makers of Bolts, Nuts and Rivets Since 1845

The new, sixth edition

of

"The Iron Ores of Lake Superior"

By Crowell & Murray

Available about July 1.

This new edition has been completely revised and brought up-to-date, and every one interested in IRON ORES should have a copy.

It gives the history of the region; its geology and mineralogy; describes the various methods of ore production; gives the classification of ores; tells how to compute their value; and describes the methods of analysis and beneficiation used on Lake Superior ores.

THE DIRECTORY, which is also included in the last half of the book, has been brought up-to-date. It gives the names, location and history of each mine together with a table showing its output for each year it has been operated.

This section also gives the analysis of the ore from each mine, and states the name of the operating company, the manager and the sales agent.

Everything you would like to know about Lake Superior ores or mines — you'll find the answer in this new iron ore encyclopedia brought right down to date.

ORDER NOW IF YOU WANT TO BE SURE OF A COPY!

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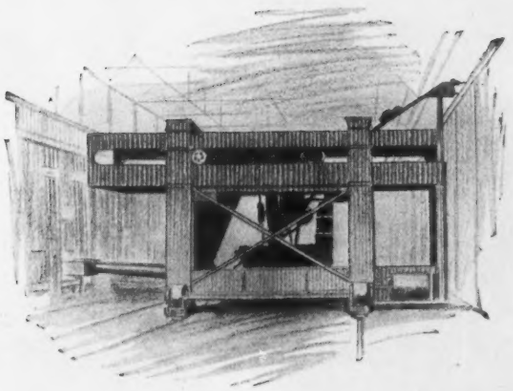

Give your bath backbone

CONTROLLING the boiling of the bath is an important job for the steel maker. When the desired carbon content has been obtained, ferromanganese will stabilize the bath and give it "backbone."

Electromet ferromanganese is furnished in large clean lumps suitable for furnace additions. Freedom from fines results in a higher manganese recovery.

Electromet service, which is back of all Electromet alloys, means prompt shipment of your orders from stock and the help of our metallurgical staff when you need it.

Write for our new booklet on the properties and uses of Electromet alloys.

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- High Carbon Ferrochrome (maximum 6% carbon)
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- Chromium-Copper
- Miscellaneous Chromium Alloys

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- Standard Ferromanganese 78 to 82%
- Low Carbon Ferromanganese
- Manganese Metal
- Manganese-Silicon
- Manganese-Copper
- Miscellaneous Manganese Alloys

SILICON

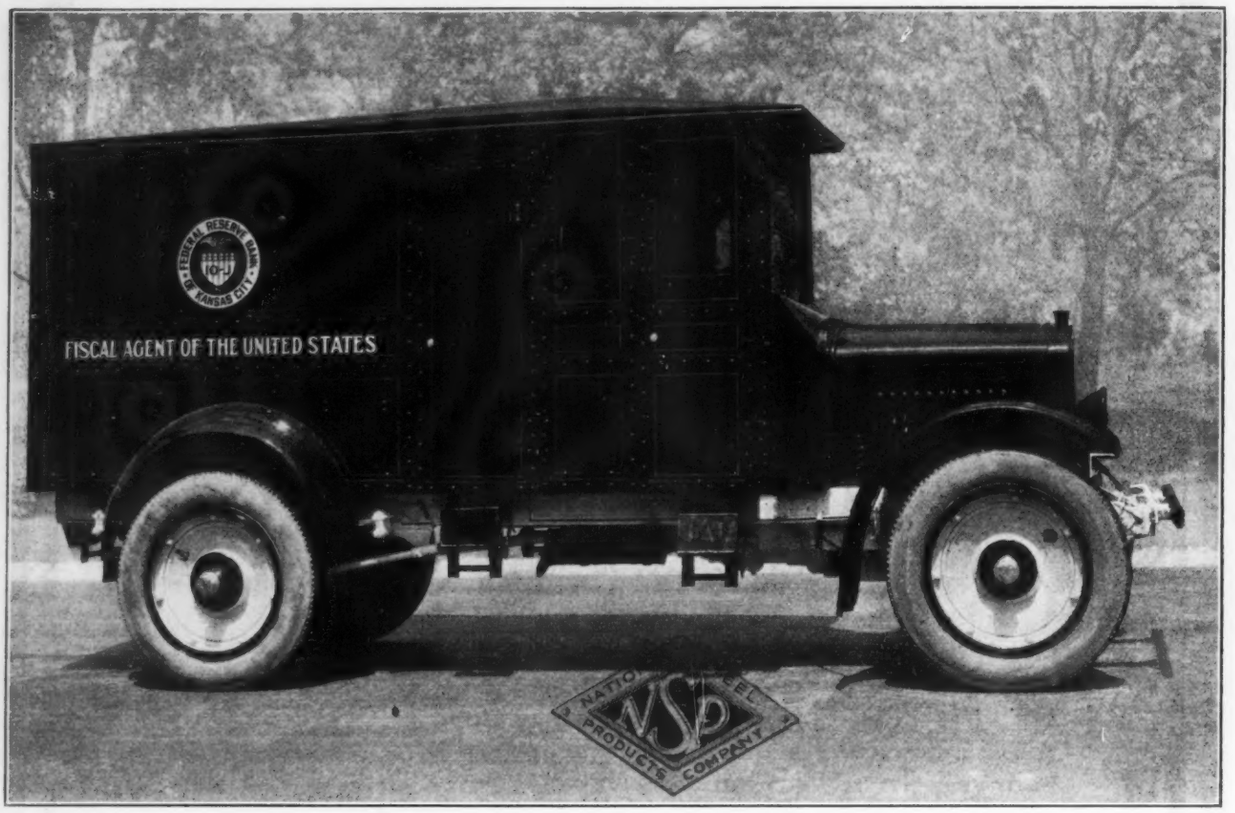
- Ferrosilicon 15%
- Ferrosilicon 50%
- Ferrosilicon 75%
- Ferrosilicon 80 to 85%
- Ferrosilicon 90 to 95%
- Refined Silicon (minimum 97% silicon)
- Calcium-Silicon
- Silicon-Copper
- Manganese-Silicon
- Silico-Manganese
- Miscellaneous Silicon Alloys

VANADIUM

- All Grades

ZIRCONIUM

- Silicon-Zirconium
- Zirconium-Ferrosilicon



Armored with "Youngstown"

Not satisfied with the ordinary run of blue annealed sheets, The National Steel Products Company of Kansas City, builder of armored steel cars like the one shown above, turned to "Youngstown" for a sheet perfectly level and with the fine finish required for a high grade job of this nature.

Steel sheet fabricators everywhere are also turning to "Youngstown" for sheets that must meet exacting requirements necessary for the finished product. Youngstown Sheets can be depended upon.

The Youngstown Sheet & Tube Company

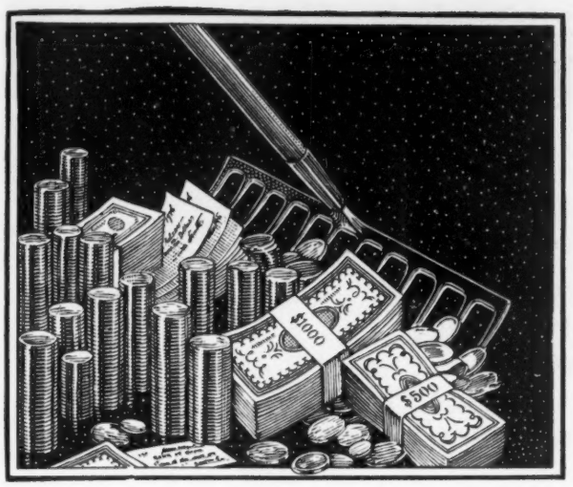
Youngstown, Ohio

DISTRICT SALES OFFICES

ATLANTA—Healey Bldg.
BOSTON—Chamber of Commerce Bldg.
BUFFALO—Liberty Bank Bldg.
CHICAGO—Conway Bldg.
CINCINNATI—Union Trust Bldg.
CLEVELAND—Union Trust Bldg.
DALLAS—Magnolia Bldg.
DENVER—Continental Oil Bldg.
DETROIT—First National Bank Bldg.
KANSAS CITY, MO.—Commerce Bldg.
MINNEAPOLIS—Andrus Bldg.
NEW ORLEANS—Hibernia Bank Bldg.
NEW YORK—30 Church St., Hudson Terminal Bldg.
PHILADELPHIA—Franklin Trust Bldg.
PITTSBURGH—Oliver Bldg.
SAN FRANCISCO—Sharon Bldg.
SEATTLE—Central Bldg.
ST. LOUIS—Mo. State Life Bldg.
YOUNGSTOWN—Stambaugh Bldg.

LONDON REPRESENTATIVE—The Youngstown Steel Products Co., 316-17 Dashwood House, Old Broad Street, London, E. C. England.

5 DAYS *instead of* five weeks



ONE OF THE TRAVELING SALESMEN for a large Milwaukee dry goods house was suddenly forced to cancel his regular trip because of a broken leg. In the emergency he decided to try Long Distance. From his sick-room he covered in five days by telephone the same territory that normally required five or six weeks of traveling. On checking up he found he had gathered in by Long Distance 90% of his usual business!

MORE AND MORE BUSINESS HOUSES are using the telephone over states and over the nation as they formerly used it to nearby towns. A long distance call appeals to the busy buyer. It commands the ear of those who would hesitate to see the salesman personally for fear needless time would be consumed. Long Distance calls are for the busy buyer or seller who must cut expense and make the most of time.

The telephone is the economical, dependable means with which almost any concern can reach any distance for business. There is hardly any limit to what the man can do who travels by telephone. His hours go further. Every day, just as in an emergency, the telephone on your desk will reach distant cities and states as surely and effectively as it connects you with the other side of town. What far-away man or concern would you like to call now? You'll be surprised how little it will cost. . . . . *Number, please?*

BELL LONG DISTANCE SERVICE

West Leechburg's Strip Mill— Designed and Built by Birdsboro

20"-16" Semi-Continuous Hot Strip Mill, designed and built for West Leechburg Steel Company, Leechburg, Pa., by Birdsboro Steel Foundry and Machine Company.

FOR West Leechburg Steel Company, Leechburg, Pa., Birdsboro designed and built the 20"-16" Semi-Continuous Hot Strip Mill illustrated above.

This Birdsboro-built mill, states the West Leechburg Steel Company, "is producing lighter gauges in extreme widths than have ever before been rolled commercially on a strip mill. It enables us to produce material 1/16-inch and lighter, varying from 6 to 18½ inches wide either in coils or cut lengths".

Perhaps Birdsboro's Engineers can help you increase production and reduce your rolling costs. A survey of your present facilities and recommendations for the modernization of existing facilities or the design of new equipment will not obligate you in any way. May we co-operate with you?

BIRDSBORO

STEEL FOUNDRY AND MACHINE COMPANY

DESIGNERS AND BUILDERS

of hydraulic presses and equipment for boiler, structural and railroad shops, shipyards, rubber mills, linoleum plants, asbestos mills and other industries requiring hydraulic equipment. Hydraulic Operating Valves. Special Machinery. Rolling Mills. Rolling Mill Machinery. Steel and Iron Castings. Rolls: "Durite", Steel, Chilled and Sand. Railroad Castings. Bolsters. Side Frames. Forging Ingots. Crushing and Concentrating Machinery. Jackson Belt Lacers.

BIRDSBORO, PENNSYLVANIA

Cut the cost of die-sinking with Evansteel die blocks

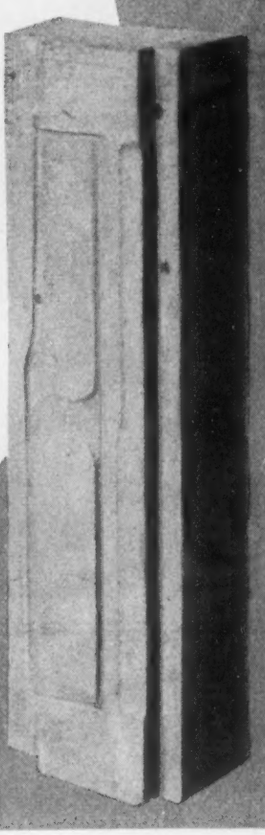
THE impression was cast in the face of this die block, leaving only a small amount of stock left for final finishing.

Frequently the saving in the cost of die sinking is enough to cover the cost of the cast steel die block in the rough. Evansteel die blocks have proved their superiority in many forge shops.

Evansteel is made of electric furnace steel, in a foundry equipped with every modern method of producing high quality castings.

Write and let us quote you a price and delivery date.

Chicago Steel Fdy. Co.
Kedzie Ave. at 37th Street
Chicago, Illinois
David Evans, President



Send for the Evansteel booklet!

EVANSTEEL for hard service

Chicago Steel Foundry Co.
Kedzie Ave. at 37th Street
Chicago, Ill.

Send me a copy of your booklet on Evansteel.

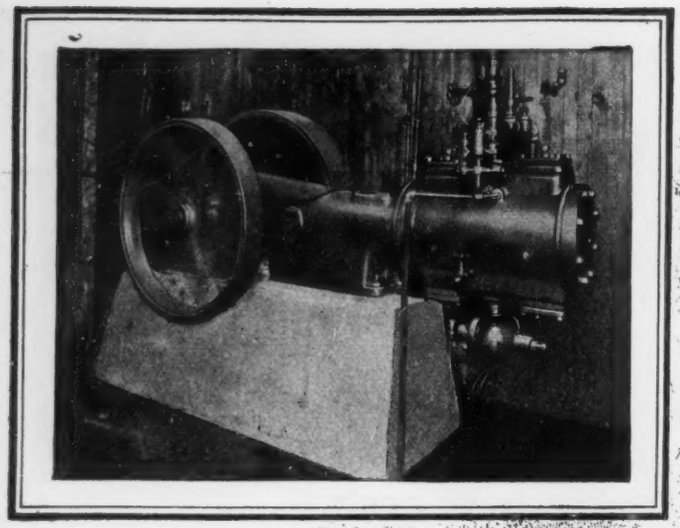
Name.....

Firm.....

Street.....

City & State.....

ITR 6-30—Gray



Class "ER" Air Compressor

R-1245

Using I-R Chipping Hammer on cylinder casting

The use of pneumatic tools effects great savings in time and labor

Over 2,000 Blows a Minute!

The plodding, uncertain thudding of the old-fashioned hammer and chisel has quickened far beyond the limits of human strength and endurance. The rhythm of the pneumatic chipping hammer tells the story of compressed air in the foundry—a story of growing production and lower costs.

There are I-R Pneumatic Tools made to facilitate operations in every department. Used in conjunction with an I-R Air Compressor, they form a most profitable combination—one that is today considered standard in many foundries throughout the world.

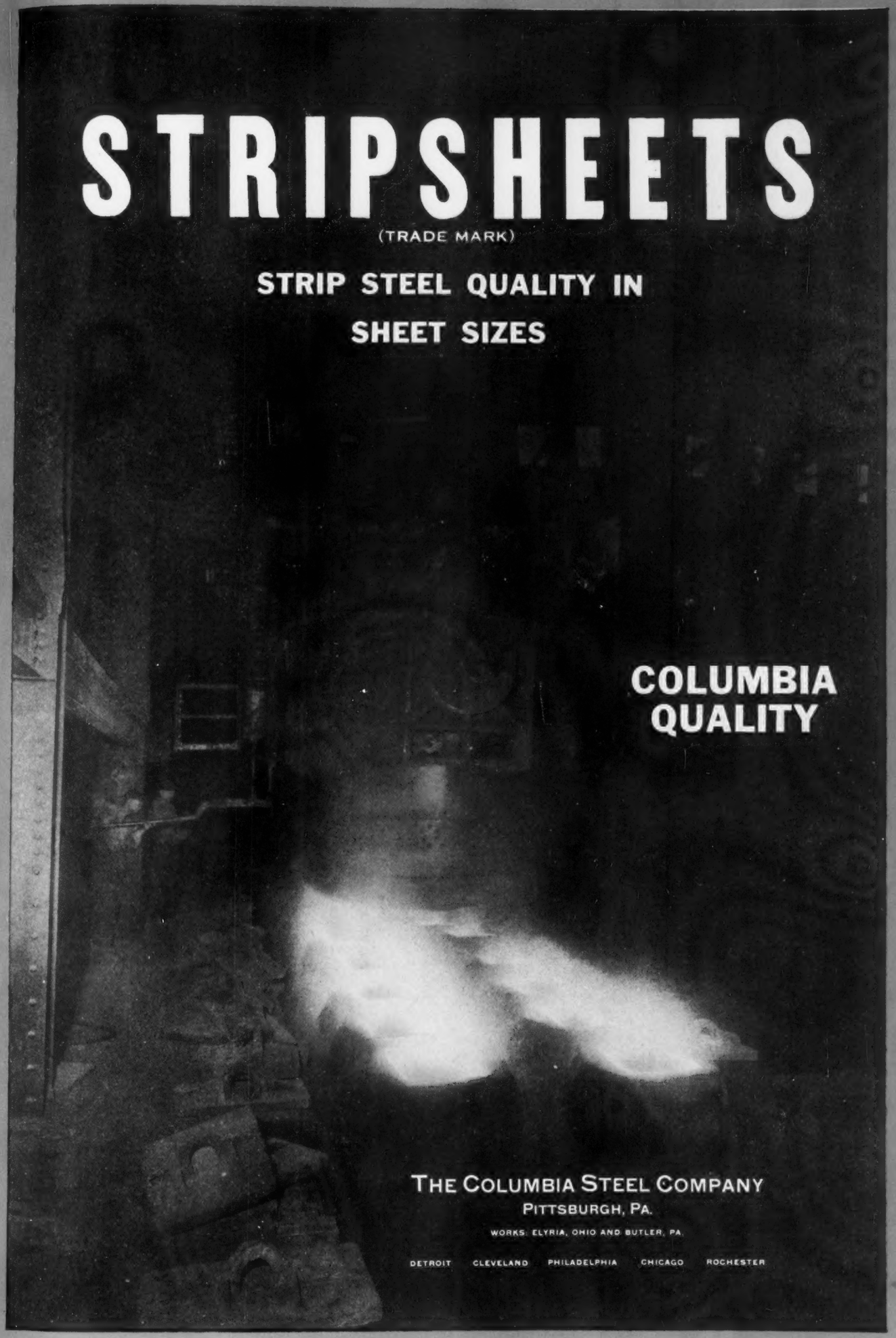
INGERSOLL-RAND COMPANY—11 BROADWAY, NEW YORK CITY

Offices in principal cities the world over

FOR CANADA REFER—CANADIAN INGERSOLL-RAND CO., LIMITED
260 ST. JAMES STREET, MONTREAL, QUEBEC

867-C

Ingersoll-Rand


STRIPSHEETS
(TRADE MARK)
STRIP STEEL QUALITY IN
SHEET SIZES
COLUMBIA
QUALITY
THE COLUMBIA STEEL COMPANY
PITTSBURGH, PA.
WORKS: ELYRIA, OHIO AND BUTLER, PA.
DETROIT CLEVELAND PHILADELPHIA CHICAGO ROCHESTER

STRIPSHEETS

(TRADE MARK)

"The first new steel commodity in forty-one years"

THE COLUMBIA STEEL COMPANY

PITTSBURGH, PA.

WORKS: ELYRIA, OHIO AND BUTLER, PA.

Detroit **Cleveland** **Philadelphia** **Chicago** **Indianapolis**

Celebratin' the Fourth

Dear Friends:

This is one day in thu year that thu old man sez nuthin' doin' tu work. He goes out fer a good time an' springs thu usual by commin' home with a load. Doggone those bootleggers.

But, folks, you must excuse 'im becuz there is none that can stand hard work an' long hours like dear Larry, an' he only "celebrates" once a year.

His loving wife

Fanny Flatspring Limber

Springs of All Types
Also Wire Forms

American Spring & Manufacturing Corp.

ELM STREET, HOLLY, MICH.

The Norton Bakelite Wheel

for High Speed Snagging

9000 surface feet per minute with safety,

Open structure,

Increased rate of production,

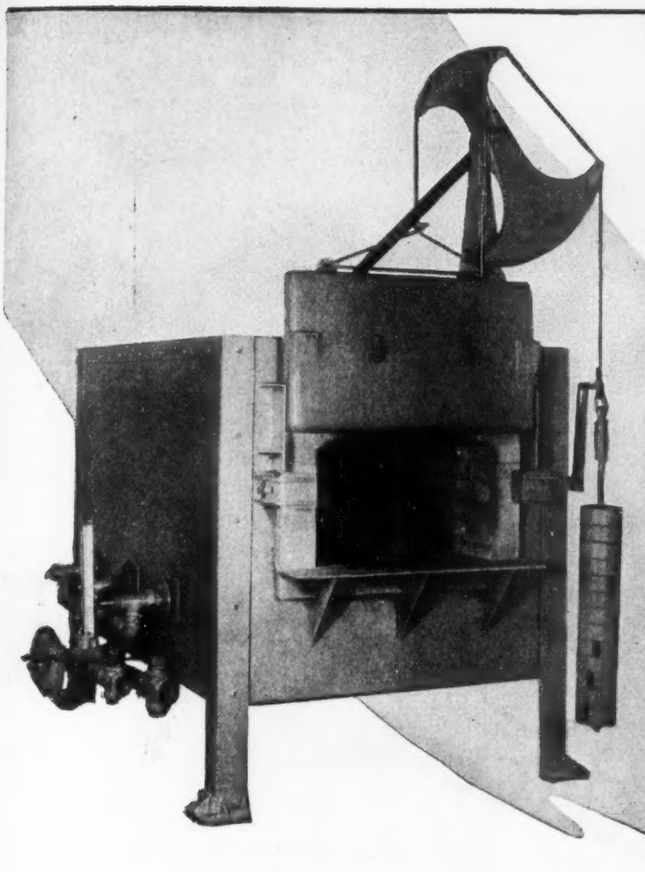
Increased production per unit of wheel,

Unaffected by heat of grinding,

—This is the Norton Bakelite Snagging Wheel. Let us send you full information about it.

NORTON COMPANY, WORCESTER, MASS.
New York Chicago Detroit Philadelphia Pittsburgh
Norton Company of Canada, Ltd., Hamilton, Ont.

NORTON
GRINDING WHEELS



Gas Fired Heat Treating Furnaces

Automatically Hold the Right Heat and the Right Atmosphere

Standard Surface Combustion Oven Furnace

For annealing, hardening, normalizing, carbonizing or tempering.

Made in 9 standard types covering a range in hearth sizes from 18″ wide x 24″ long x 14″ high, to 30″ wide x 72″ long x 18″ high.

This is one unit of the standard line of Surface Combustion heat treating furnaces which include smaller oven furnaces for similar purposes, or for high speed steel, pot hardening furnaces, oil tempering furnaces, forging furnaces and rivet heaters.

CONTROLLED *by a single valve,* these furnaces are automatically maintained at the required temperature, with the right atmosphere, regardless of pressure changes in air and gas lines. A definite gauge setting delivers the exact conditions required.

More uniform heat treating at a greatly improved production rate is assured, because the human element is almost completely eliminated.

Fuel Bills Cut from 20% to 50%; Maintenance at a Minimum

These furnaces are the result of the proper adaption of the unique principle of "Surface Combustion" to a scientifically designed, sturdily constructed, thoroughly modern furnace. The Surface Combustion Burner gives complete and instantaneous combustion of an exactly proportioned, thoroughly mixed and automatically maintained supply of air and gas. This principle of combustion, combined with furnace design and construction which insures uniform and efficient heat distribution, and maximum conservation of heat, leads to material economies in fuel. Savings of 20% to 50% are common.

The uniform temperatures maintained eliminate the stresses and strains of fluctuating heat. This feature, combined with the sturdy construction and high quality of material used, greatly reduces maintenance costs. In addition the Surface Combustion flame is not destructive to refractories and insulation.

Standard Surface Combustion Furnaces are low in cost, because they are produced in volume, and distributed from stock. Fuel savings alone usually repay the initial cost in a short time

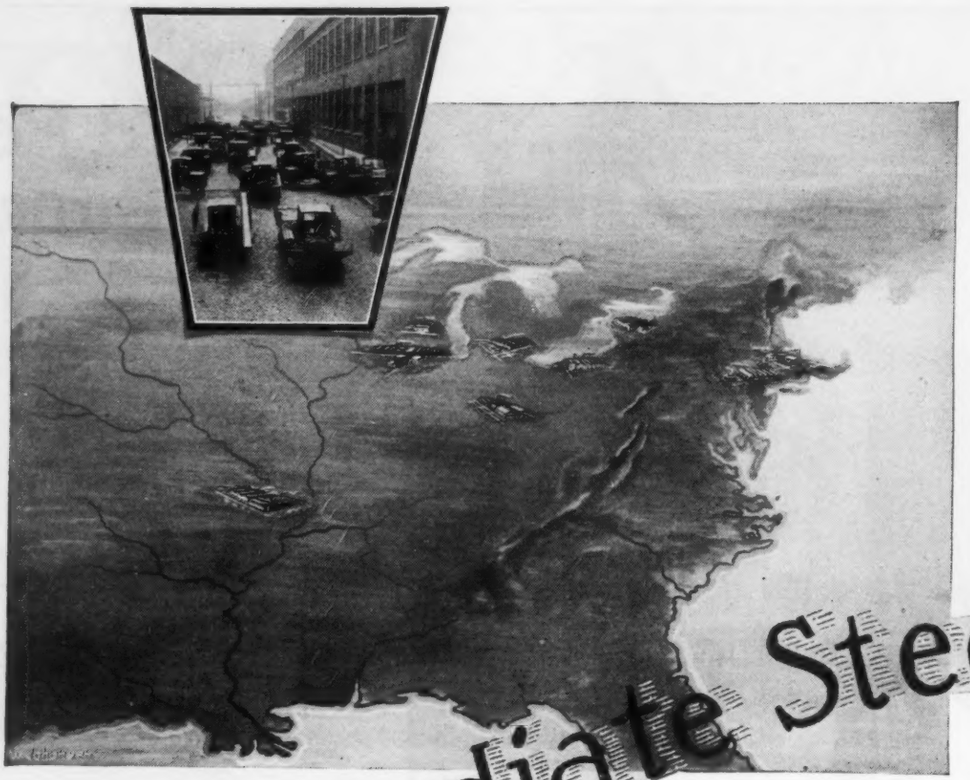
Bulletin F not only describes the Surface Combustion principle in full but gives detailed operating characteristics on other Surface Combustion furnaces. We will be glad to send as many copies as you require.

The Surface Combustion Co.

366 GERARD AVENUE, NEW YORK, N.Y.

Branch Offices in All Principal Cities

WHEREVER HEAT IS USED IN INDUSTRY



Immediate Steel

Acres of warehouses loaded with everything in iron and steel and fleets of trucks in daily service are the basis for immediate steel.

The huge shears, high speed saws, time saving methods of handling and shipping all play their part in getting the steel you need delivered in the shortest possible time.

But, even more important is the experienced organization working with this equipment—helping with your problems and giving personal attention to individual requirements.

Bars	Plates	Reinforcing Steel	Babbitt Metal
Shapes	Sheets	Firmtread Plates	Boiler Tubes and Fittings
Structurals	Rivets	Forging Bars	Alloy Steel
Rails	Bolts	Billets	Tool Steel
Shafting	Wire	Turnbuckles	Small Tools
Strip Steel	Chain		Machinery, etc.

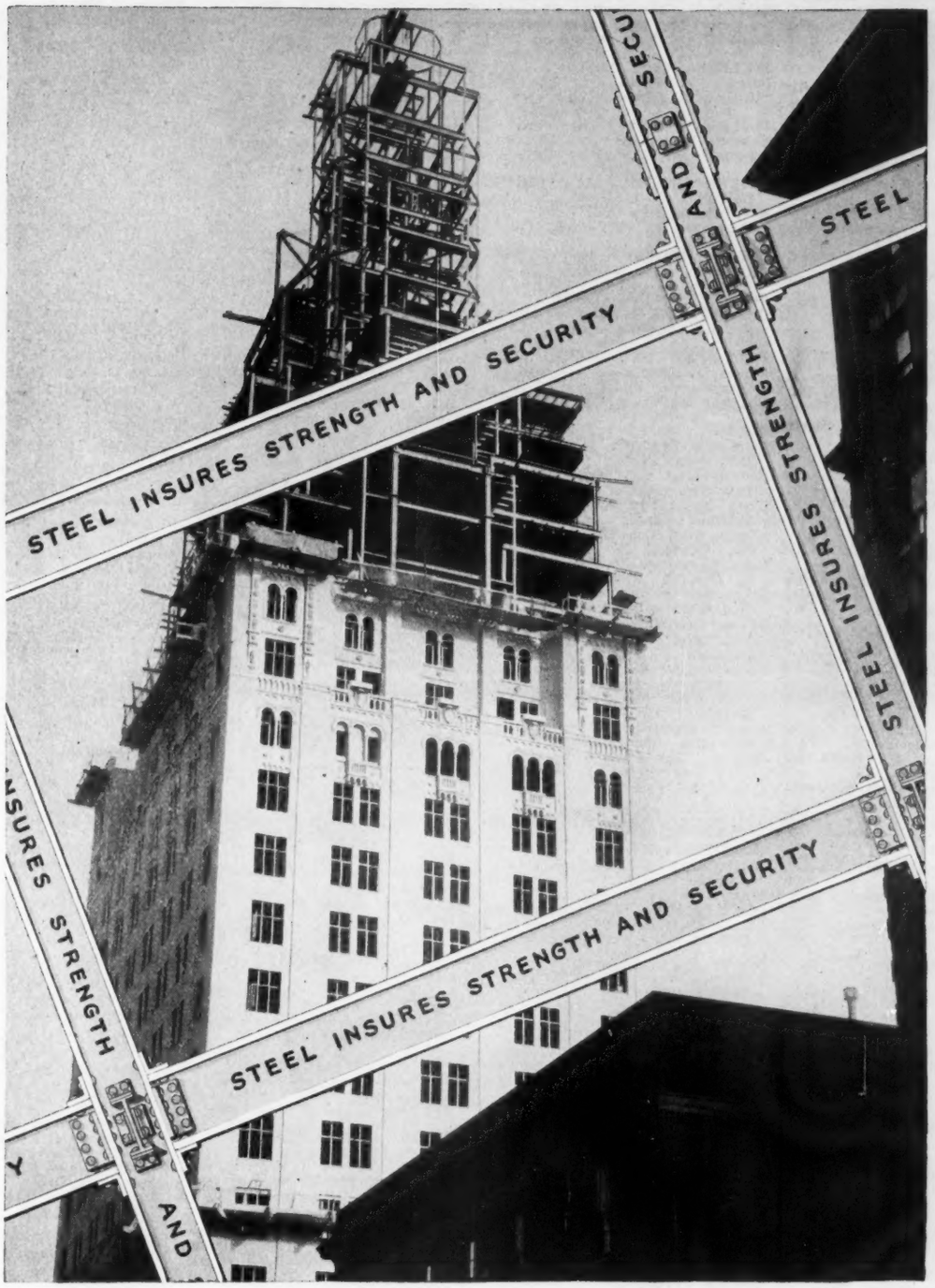
Write for the Journal and Stock List—the "key" to Immediate Steel.

JOSEPH T. RYERSON & SON INC.
ESTABLISHED 1842

PLANTS: CHICAGO ST. LOUIS CLEVELAND JERSEY CITY MILWAUKEE CINCINNATI DETROIT BUFFALO BOSTON

REPRESENTATION IN: DENVER LOUISVILLE SAN FRANCISCO NEW YORK MINNEAPOLIS TULSA HOUSTON LOS ANGELES NEWARK

RYERSON STEEL-SERVICE


STEEL INSURES STRENGTH AND SECURITY
STEEL INSURES STRENGTH AND SECURITY
STEEL INSURES STRENGTH AND SECURITY
STEEL INSURES STRENGTH AND SECURITY
STEEL

"NO ONE HAD TOLD ME"

A BUSINESS man said to his club-car companion, "Yes, of course my new building is of steel construction, although strangely enough I had originally intended to use other materials. No one had ever told me anything about steel. Fortunately I took the trouble to investigate, and it's a lucky thing for me that I did."

It wasn't the business man's fault that no one had told him about steel. He simply hadn't realized that steel is the strongest, safest, most adaptable of all building materials. The American Institute of Steel Construction is now "telling him" and thousands of other prospective users of structural steel, in extensive educational advertising. Write for copies of our publications—for our Standard Specification and Code of Practice, and for the illustrated fact-book "STEEL NEVER FAILS."

This advertisement is published by the American Institute of Steel Construction, a non-profit service organization of 218 members comprising the structural steel industry in the United States and Canada. The purpose of the Institute is to extend the use of structural steel in construction work of every size and type, from residences to skyscrapers and bridges. The Institute offers fullest co-operation with architects, engineers, the public and all branches of the building trades. Correspondence invited. Address: Lee H. Miller, M. Am. Soc. C. E., Chief Engineer, AMERICAN INSTITUTE OF STEEL CONSTRUCTION, Inc., 285 Madison Avenue, New York City.

BENZOL AND TOLUOL RECOVERY PLANTS
Koppers Construction Co., The, Union Trust Bldg., Pittsburgh, Pa.

BILLETS (Alloy and Carbon Steel)
Andrews Steel Co., Newport, Ky.
Central Alloy Steel Corp., Massillon, O.

BILLETS (Die Stock Steel)
Andrews Steel Co., Newport, Ky.

BILLETS (Forging)
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Central Alloy Steel Corp., Massillon, O.
Heppenstall Forge & Knife Co., 47th and Hatfield Sts., Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Wood, Alan, Iron & Steel Co., Widener Bldg., Philadelphia, Pa.

BILLETS (Forging, Alloy Steel)
Bethlehem Steel Co., Bethlehem, Pa.

BILLETS (Re-Rolling)
Andrews Steel Co., Newport, Ky.

BILLETS AND BLOOMS
American Rolling Mill Co., Middletown, O.
Armstrong, Sir W. G., Whitworth & Co., Ltd., Kinnaird House, Pall Mall East, London, S. W. 1, England.
Bethlehem Steel Co., Bethlehem, Pa.
Central Alloy Steel Corp. Massillon, O.
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Illinois Steel Co., 208 South La Salle St., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Interstate Iron & Steel Co., 104 S. Michigan Ave., Chicago, Ill.
Wood, Alan, Iron & Steel Co., Widener Bldg., Philadelphia, Pa.

BLANKS (Rawhide Gear)
Chicago Rawhide Mfg. Co., The, 1305 Elston Ave., Chicago, Ill.

BLANKS (Ring, Gear and Sprocket)
Akron-Selle Co., Akron, O.
Strong Steel Foundry Co., 33 Norris St., Buffalo, N. Y.

BLAST FURNACES — See FURNACES (Blast)

BLOWERS
General Electric Co., Schenectady, N. Y.
Ingersoll-Rand Co., 11 Broadway, New York City.
Spencer Turbine Co., Hartford, Conn.

BLOWERS (Pressure)
Spencer Turbine Co., Hartford, Conn.

BLOWERS (Rotary Positive)
Connersville Blower Co., The, Connersville, Ind.
Roots, P. H. & F. M., Co., Connersville, Ind.

BLOW PIPES (Brazing, Welding, Cutting, Etc.)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

BLUE PRINTING MACHINERY
Pease, C. F., Co., The, 853 N. Franklin St., Chicago, Ill.

BLUE PRINT PAPER
Pease, C. F., Co., The, 853 N. Franklin St., Chicago, Ill.

BOILERS
Combustion Engineering Corp., 200 Madison Ave., New York City.

BOILER HEADS
Bethlehem Steel Co., Bethlehem, Pa.

BOILERS AND SUPERHEATERS
Babcock & Wilcox Co., The, 85 Liberty St., New York City.
Sotter Bros., Inc., Pottstown, Pa.

BOILERS (Waste Heat)
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

BOILERS (Water Tube)
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

BOILER SETTINGS AND CHIMNEYS
Rust Engineering Co., 311 Ross St., Pittsburgh, Pa.

BOILER TUBES — See TUBES (Boiler)

BOILER WALL COATING
Celite Products Co., 1320 So. Hope St., Los Angeles, Calif.

BOLT AND NUT MACHINERY
Landis Machine Co., Waynesboro, Pa.
National Machinery Co., Tiffin, O.

BOLTS
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Clark Bros. Bolt Co., Milldale, Conn.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Lake Erie Bolt & Nut Co., 915 E. 63rd St., Cleveland, O.
Neely Nut & Bolt Co., 2101 Wharton St., Pittsburgh, Pa.
Oliver Iron & Steel Corp., So. 10th and Muriel Sts., Pittsburgh, Pa.
Republic Iron & Steel Co., Youngstown, Ohio.
Rockford Bolt Co., 220 Mill St., Rockford, Ill.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Ryerson, Jos T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

BOLTS (Acid Resisting)
Alcumite Corp., The, Dayton, O.

BOLTS (Carriage)
Clark Bros. Bolt Co., Milldale, Conn.
Kirk-Latty Co., 1971 W. 85th St., Cleveland, O.
Lamson & Sessions Co., The, 2188 Scranton Rd., Cleveland, O.

BOLTS (Heat Treated)
Bethlehem Steel Co., Bethlehem, Pa.
Oliver Iron & Steel Corp., So. 10th and Muriel Sts., Pittsburgh, Pa.
Wheelock, Lovejoy & Co., Inc., 128 Sidney St., Cambridge, Mass.

BOLTS (Machine)
Kirk-Latty Co., 1971 W. 85th St., Cleveland, O.
Lamson & Sessions Co., The, 2188 Scranton Rd., Cleveland, O.

BOLTS (Stove)
Kirk-Latty Co., 1971 W. 85th St., Cleveland, O.

BOLTS & NUTS (Brass & Bronze)
Lamson & Sessions Co., The, 2188 Scranton Rd., Cleveland, O.

BOOKS (Technical)
Penton Publishing Co., Cleveland, O.

BORING MACHINES (Horizontal)
Diamond Clamp & Flask Co., Richmond, Ind.

BOSH PLATES (Copper)
Lawrenceville Bronze Co., 518 Bessemer Bldg., Pittsburgh, Pa.

BOXES (Carbonizing)
Farrell-Cheek Steel Foundry Co., Sandusky, O.

BOXES (Open Hearth Charging)
Strong Steel Foundry Co., 33 Norris St., Buffalo, N. Y.

BOXES (Steel)
Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.

BOXES (Tote)
Sterling Wheelbarrow Co., Milwaukee, Wis.

BRAKES (Crane)
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland, O.

BRAKES (Electric)
Clark Controller Co., The, 1146 E. 152nd St., Cleveland, O.
Cutler-Hammer Mfg. Co., The, Milwaukee, Wis.
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland, O.
General Electric Co., Schenectady, N. Y.

BRASS
Copper & Brass Research Ass'n., 25 Broadway, New York City.
Williams & Co., Inc., 915-937 Pennsylvania Ave., Pittsburgh, Pa.

BRICK (Silica, Magnesia, Chrome Fire Clay)
Botfield Refractories Co., Swanson and Clymer St., Philadelphia, Pa.
General Refractories Co., 117 S. 16th St., Philadelphia, Pa.
Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittsburgh, Pa.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Stowe-Fuller Refractories Co., 1659 Union Trust Bldg., Cleveland, O.
U. S. Refractories Corp., Mt. Union, Pa.

BRICK INSULATING—SEE INSULATING BRICK

BRIDGE CRANES (Ore and Coal Handling)
Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O.

BRIDGES, BUILDINGS, VIADUCTS, STACKS (Steel)
American Bridge Co., 71 Broadway, New York City.
Belmont Iron Works, 22nd and Washington Ave., Philadelphia.
Blystone Mfg. Co., Ironton St., Cambridge Springs, Pa.
Eichleay, John, Jr., Co., S. 20th and Wharton, Pittsburgh, Pa.
McClintic-Marshall Co., Oliver Bldg., Pittsburgh, Pa.
Morgan Engineering Co., Alliance, Ohio.
Mt. Vernon Bridge Co., Mt. Vernon, O.
Phoenix Bridge Co., 20 S. 15th St., Philadelphia, Pa.
Steel Plate Products Co., Pottstown, Pa.

BRONZE
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.

BRONZE (Centrifugally Cast)
Penn Mold & Mfg. Co., Wheeling Trust Bank Bldg., Wheeling, W. Va.

BRONZE (Corrosive Resistant)
Alcumite Corp., The, Dayton, O.
American Manganese Bronze Co., Holmesburg Junction, Philadelphia, Pa.
Hills-McCanna Co., 2025 Elston Ave., Chicago, Ill.

BRONZE (High Tensile)
Hills-McCanna Co., 2025 Elston Ave., Chicago, Ill.

BRONZE (Manganese)
American Manganese Bronze Co., Holmesburg Junction, Philadelphia, Pa.
Bethlehem Steel Co., Bethlehem, Pa.

BUCKETS (Clam Shell)
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.
Brosius, Edgar E., Sharpsburg P. O., Pittsburgh, Pa.
Browning Crane Co., E. 162nd and Waterloo Rd., Cleveland, O.
Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O.
Williams, G. H., Co., 611 Haybarger Lane, Erie, Pa.

BUCKETS (Dumping)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.

BUCKETS (Elevator)
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.

BUCKETS (Grab)
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.
Brosius, Edgar E., Sharpsburg P. O., Pittsburgh, Pa.
Brown Hoisting Machinery Co., 4403 St. Clair Ave., Cleveland, O.
Browning Crane Co., E. 162nd and Waterloo Rd., Cleveland, O.
Harnischfeger Corp., 3811 National Ave., Milwaukee, Wis.
Orton Crane & Shovel Co., 608 S. Dearborn St., Chicago, Ill.
Williams, G. H., Co., 611 Haybarger Lane, Erie, Pa.

BUILDINGS (Steel)—See BRIDGES, BUILDINGS, VIADUCTS, STACKS (Steel)

BULLDOZERS
Beatty Machine & Mfg. Co., Hammond, Ind.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Long & Allstatter Co., Hamilton, O.

BURNERS (Acetylene) — See TORCHES AND BLOWERS (Acetylene, Blow, Oxy-acetylene)

BURNERS (Automatically Regulated)
American Heat Economy Bureau, Inc., Wabash Bldg., Pittsburgh, Pa.

BURNERS (Fuel, Oil, Gas and Combination)
Strong, Carlisle & Hammond Co., The, 1392 W. 3rd St., Cleveland, O.
Surface Combustion Co., 366 Gerard Ave., New York City.

BURNERS (Oil)
Best, W. N., Corp., Sixth Ave. and 31st St., New York City.

BY-PRODUCT PLANTS
Koppers Construction Co., The, Union Trust Bldg., Pittsburgh, Pa.

CAN MAKING MACHINERY
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.

CARBON BURNING APPARATUS
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

CAR DUMPERS (Coal, Ore and Ash Handling Machinery)
Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O.

CAR PULLERS (Electric Capstan)
Sprague Electric Hoist Division of the Shepard Electric Crane & Hoist Co., 30 Church St., New York City.

CARS (Industrial and Mining)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.

CARS (Ingot and Open Hearth Charging)
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.

CASTINGS (Acid Resisting)
Alcumite Corp., The, Dayton, O.
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.

CASTINGS (Alloy Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Chicago Steel Foundry Co., Kedzie Ave. and 37th St., Chicago, Ill.
Cincinnati Steel Castings Co., The, Queen City & Spring Grove Aves., Cincinnati, O.
Farrell-Cheek Steel Foundry Co., Sandusky, O.
Industrial Steel Casting Co., Toledo, O.
Nugent Steel Castings Co., 31st & Wood Sts., Chicago, Ill.
Sivyer Steel Casting Co., Milwaukee, Wis.
Treadwell Engineering Co., Easton, Pa.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

The Feet Get a Better Grip On Mitco's Square Edge Bars

LOOK closely at Mitco Interlocked Steel Floor Grating, or Mitco Shur-Site Stair Treads, and you will note that the bearing and transverse bars have square edges. The edges of the ordinary commercially rolled bars, as every steel buyer knows, are slightly rounded.

The square edges of Mitco Bars and the hydraulic pressure which forces the lateral or transverse bars into the bearing bars, insure a flush, non-slipping surface, ideal under foot and excellent for wheeling and trucking.

Square edge bars may seem a small point to emphasize, but it is only one of a number of distinctive advantages which, taken together, make Mitco the ideal steel floor grating.

HENDRICK MANUFACTURING COMPANY
43 Dundaff St., Carbondale, Pa.
New York Office: 15 John St., Phone Cortlandt 2440
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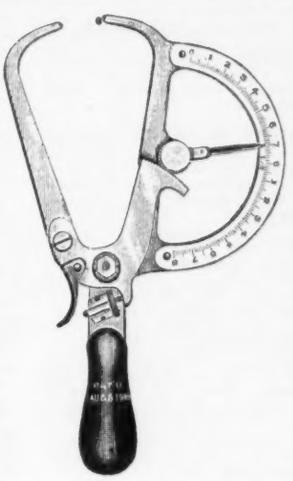
Makers of Hendrick Perforated Metal Screens

Other Mitco advantages are illustrated in a new booklet, just off the press. Send for a copy.

MITCO
INTERLOCKED STEEL FLOOR GRATING
The Grating With Every Advantage
Strength — Permanent Rigidity — Non-Slipping, Non-Clogging Surface — Light — Ventilation

Indicating Calipers—

a Remarkable New Tool for General Shop Use



The 3" Indicating Calipers are graduated $\frac{1}{64}$ inches. Every eighth graduation ($\frac{1}{8}$") is marked 1-2-3 etc. to 8 and repeated to 3 inches. The fourth line is made longer to make reading of $\frac{1}{16}$" easier. This scale enlarges two times over actual measurements.

We can also furnish the same caliper graduated in 1/100 inches, indicating 2 inches.

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1434-1444 East 49th St. Cleveland, Ohio
Merchants — Manufacturers — Importers

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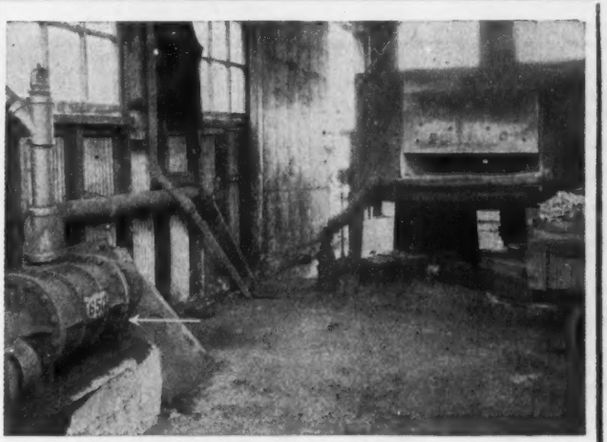
Low prices on work of every description. Pattern-makers Supplies and Hand Tools, Electrical Pattern Equipment, Foundry Materials. Glue — Shellac — Alcohol — Rosin Brass Dowels, Flask Pins, Core Box Pins, Bushings for Core Driers.



ROOTS "Acme" Blowers are made in sizes up to 400 c.f.m. and operate at pressures up to 6 lbs. per sq. in.

There are one or more places in your plant where you can use a Roots "Acme" to advantage. Their easy application and trouble free operation recommend them for any use that requires dependable service. Ask for Bulletin "B-23."

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ROOTS ACME BLOWERS AND GAS PUMPS

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NEW YORK 120 Liberty St.
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Bethlehem Steel Co., Bethlehem, Pa.
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Enterprise Brass Works, Muskegon, Mich.
Hills-McCanna Co., 2025 Elston Ave., Chicago, Ill.
Lawrenceville Bronze Co., 518 Bessemer Bldg., Pittsburgh, Pa.
Mesta Machine Co., Homestead, Pa.
Metal & Alloy Specialties Co., Inc., 1870 Elmwood Ave., Buffalo, N. Y.

CASTINGS (Chemical and Acid Resisting)
Duriron Co., Inc., The, Dayton, O.

CASTINGS (Die) See DIE CASTINGS

CASTINGS (Electric Steel)
Chicago Steel Foundry Co., Kedzie Ave. & 37th St., Chicago, Ill.
Cincinnati Steel Castings Co., The, Queen City & Spring Grove Aves., Cincinnati, O.
Crucible Steel Castings Co., The, Almira and W. 84th St., Cleveland, O.
Farrell-Cheek Steel Foundry Co., Sandusky, O.
Industrial Steel Casting Co. Toledo, O.
Maynard Electric Steel Castings Co., 2-12 Kilbourn Rd., Milwaukee, Wis.
Nugent Steel Castings Co., 31st & Wood Sts., Chicago, Ill.
Pittsburgh Electric Furnace Corp., P. O. Box 1125, Pittsburgh, Pa.
Pittsburgh Malleable Iron Co., 34th & Smallman Sts., Pittsburgh, Pa.
Sivyer Steel Casting Co., Milwaukee, Wis.
West Steel Castings Co., The, 805 E. 70th St., Cleveland, O.

CASTINGS (Finished Brass)
Doehler Die Casting Co., Ninth & Court Sts., Brooklyn, N. Y.

CASTINGS (Gray Iron)
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Cascade Foundry Co., 19th & Plum Sts., Erie, Pa.
Cyclops Foundry Co., 1503 Union Bank Bldg., Pittsburgh, Pa.
Forest City Foundry & Manufacturing Co., The, 1220 Main St., Cleveland, O.
Lake Shore Engine Works, Marquette, Mich.
Mackintosh-Hemphill Co., 12th & Etna Sts., Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
National Roll & Foundry Co., The, Avonmore, Pa.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.
Treadwell Engineering Co., Easton, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Walworth Run Foundry Co., The, W. 27th & Nickel Plate R. R., Cleveland, O.
Wheeling Mold & Foundry Co., Wheeling, W. Va.

CASTINGS (Heat Resistant)
Farrell-Cheek Steel Foundry Co., Sandusky, O.

CASTINGS (Malleable)
Haven Malleable Castings Co., The, Knowlton St., Cincinnati, O.
Illinois Malleable Iron Co., 1801 Diversey Blvd., Chicago, Ill.
Iowa Malleable Iron Co., Fairfield, Iowa.
Kalamazoo Malleable Iron Co., Kalamazoo, Mich.
Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.
Marion Malleable Iron Works, Marion, Ind.
Meeker Foundry Co., Clay & Ogden Sts., Newark, N. J.
Midwest Casting Co., Middletown, O.
Moline Malleable Iron Co., St. Charles, Ill.
Newark Malleable Iron Works, Newark, N. J.
Northern Malleable Iron Co., St. Paul, Minn.
Oriskany Malleable Iron Co., Oriskany, N. Y.
Peoria Malleable Castings Co., Peoria, Ill.
Pittsburgh Malleable Iron Co., 34th & Smallman Sts., Pittsburgh, Pa.
Rockford Malleable Iron Works, Rockford, Ill.
Ross-Meehan Foundries, Chattanooga, Tenn.,
Vermillion Malleable Iron Co., Hoopeston, Ill.
Zanesville Malleable Co. Zanesville, O.

CASTINGS (Monel Metal)
Pittsburgh Valve, Foundry & Construction Co., 26th & A. V. Ry., Pittsburgh, Pa.

CASTINGS (Nickel Chromium)
Chicago Steel Foundry Co., Kedzie Ave. at 37th St., Chicago, Ill.

CASTINGS (Semisteel)
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

CASTINGS (Steel)
Allegheny Steel Co., Brackenridge, Pa.
American Adamite Co., The, 12th & Etna Sts., Pittsburgh, Pa.
American Steel Foundries, 410 No. Michigan Ave., Chicago, Ill.
Armstrong, Sir W. G., Whitworth & Co., Ltd., Kinnaird House, Pall Mall East, London, S. W. 1, England.
Atlas Steel Castings Co., 1963 Elmwood Ave., Buffalo, N. Y.
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Chicago Steel Foundry Co., Kedzie Ave. at 37th St., Chicago, Ill.
Columbia Steel Corp., Balfour Bldg., San Francisco, Calif.
Commercial Steel Castings Co., The, Marion, O.
Crucible Steel Castings Co., The, Almira and W. 84th St., Cleveland, O.
Era Steel Co., The, Bucyrus, O.
Farrell-Cheek Steel Foundry Co., Sandusky, O.
Industrial Steel Casting Co., Toledo, O.
Mackintosh-Hemphill Co., Pittsburgh, Pa.
Maynard Electric Steel Castings Co., 2-12 Kilbourn Rd., Milwaukee, Wis.
Mesta Machine Co., Homestead, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
National Roll & Foundry Co., The, Avonmore, Pa.
Nugent Steel Castings Co., 31st & Wood Sts., Chicago, Ill.
Reliance Steel Casting Co., 28th and Smallman Sts., Pittsburgh, Pa.
Ross-Meehan Foundries, Chattanooga, Tenn.
Sharon Foundry Co., Sharon, Pa.
Sivyer Steel Casting Co., Milwaukee, Wis.
Smith, George H., Steel Casting Co., Milwaukee, Wis.
Stroh Steel Hardening Process Co., Westinghouse Bldg., Pittsburgh, Pa.
Strong Steel Foundry Co., 88 Norris St., Buffalo, N. Y.
Treadwell Engineering Co., Easton, Pa.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
West Steel Castings Co., The, 805 E. 70th St., Cleveland, O.
Wheeling Mold & Foundry Co., Wheeling, W. Va.

CASTINGS (Worm & Gear Bronze)
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.

CASTORS (Plate Mill)—See PLATE CASTORS

CEMENT (High Temperature)
Botfield Refractories Co., Swanson and Clymer Sts., Philadelphia, Pa.
Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittsburgh, Pa.
Quigley Furnace Specialties Co., 26 Cortlandt St., New York City.

CEMENT (Silica and Chrome)
General Refractories Co., 117 S. 16th St., Philadelphia, Pa.

CEMENT MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

CENTRAL STATION EQUIPMENT
General Electric Co., Schenectady, N. Y.

CHAINS (Crane & Hoist)
American Chain Co., Bridgeport, Conn.
Carroll Chain Co., The, 265 Hosack St., Columbus, O.

CHAINS FOR ALL PURPOSES
American Chain Co., Bridgeport, Conn.
Carroll Chain Co., The, 265 Hosack St., Columbus, O.

CHAINS (Power Transmission)
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.

CHAINS (Sling)
Carroll Chain Co., The, 265 Hosack St., Columbus, O.

CHANNELS—See STEEL (Structural)

CHAPLETS
Erdle Perforating Co., 171 York St., Rochester, N. Y.

CHARCOAL
Hillman Coal & Coke Co., First National Bank Bldg., Pittsburgh, Pa.

CHARGING MACHINES (Cupola)
Roots, P. H. & F. M., Co., Connersville, Ind.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.

CHEMICALS
American Chemical Paint Co., Ambler, Pa.
Ford, The J. B., Co., Wyandotte, Mich.

CHISEL BLANKS
Hunter Saw & Machine Co., 5656 Butler St., Pittsburgh, Pa.
Marchant, George F., Co., 1434 S. Rockwell St., Chicago, Ill.

CHROME ORE
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Samuel, Frank, & Co., Harrison Bldg., Philadelphia, Pa.

CHROME VANADIUM
Allen, Edgar, Steel Co., Inc., 718-722 W. Lake St., Chicago, Ill.

CHROMIUM METAL
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.

CHUCKS (Lathe)
Whiton, D. E., Machine Co., New London, Conn.

CHUCKING MACHINES (Automatic, Multiple Spindle)
National Acme Co., E. 131st St. & Coit Rd., Cleveland, O.

CLEANERS (Metal)—See METAL CLEANERS

CLEANING SPECIALTIES
American Chemical Paint Co., Ambler, Pa.
Ford, The J. B., Co., Wyandotte, Mich.

CLUTCH CONES
Transue & Williams Steel Forging Corp., Alliance, O.

CLUTCHES
Johnson, Carlyle, Machine Co., The, Manchester, Conn.

CLUTCHES (Cut-Off Coupling)
Johnson, Carlyle, Machine Co., The, Manchester, Conn.

CLUTCHES (Friction)
Johnson, Carlyle, Machine Co. The, Manchester, Conn.
Jones, W. A., Foundry & Machine Co., 4437 W. Roosevelt Ave., Chicago, Ill.

COAL (Annealing & Melting)
North American Coal Corp., The, Union Trust Bldg., Cleveland, O.

COAL (Gas & By-Products)
North American Coal Corp., The, Union Trust Bldg., Cleveland, O.

COAL (Smithing)
North American Coal Corp., The, Union Trust Bldg., Cleveland, O.

COAL (Steam)
North American Coal Corp., The, Union Trust Bldg., Cleveland, O.

COAL AND COKE
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.
Eaton, Rhodes & Co., First National Bank Bldg., Cincinnati, O.
Hanna, The M. A., Co., Leader Bldg., Cleveland, O.
Hillman Coal & Coke Co., First National Bank Bldg., Pittsburgh, Pa.
Park & Williams, Real Estate Trust Bldg., Philadelphia, Pa.
Pickands, Mather & Co., Union Trust Bldg., Cleveland, O.
Pilling & Co., Inc., 1500 Chestnut St., Philadelphia, Pa.
Pittsburgh Coal Co., Oliver Bldg., Pittsburgh, Pa.
Rogers Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.
Snyder, W. P., Co., Oliver Bldg., Pittsburgh, Pa.
Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birmingham, Ala.
Tutein, E. Arthur, Inc., 100 Milk St., Boston, Mass.

COAL CRUSHERS AND PULVERIZERS
Bartlett, C. O., & Snow Co., 6213 Harvard Ave., Cleveland, O.
Orton Crane & Shovel Co., 608 S. Dearborn St., Chicago, Ill.

COAL, ORE and ASH HANDLING MACHINERY
Bartlett, C. O., & Snow Co., 6213 Harvard Ave., Cleveland, O.
Brown Hoisting Machinery Co., 4403 St. Clair Ave., Cleveland, O.
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.
Orton Crane & Shovel Co., 608 So. Dearborn St., Chicago, Ill.
Sprague Electric Hoist Division of the Shepard Electric Crane & Hoist Co., 30 Church St., New York City.

COKE—See COAL AND COKE

COKE OVEN MACHINERY
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.
Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O.

COKE OVENS (By-Product)
Foundation Oven Corp., 120 Liberty St., New York City.
Koppers Construction Co., The, Union Trust Bldg., Pittsburgh, Pa.

COMPENSATORS (Automatic)
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland, O.

COMPRESSORS (Air)
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Chicago Pneumatic Tool Co., 6 E. 44th St., New York City.
General Electric Co., Schenectady, N. Y.
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

"Traction efficiency" is only one of many valuable features of "Subway" —a surface easy to roll things on in any direction, yet safe and non-slipping for the man on the job. Many other features are described in Catalog H-32.
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LONG ISLAND CITY, N.Y. U.S.A.
Established in 1902
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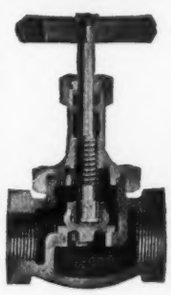

Manufacturer of A Complete Line of Valves and Fittings

The Jarecki Manufacturing Company produce a complete line of Valves and Fittings for every purpose. Having a complete range of sizes and weights in every style offers you a great advantage in purchasing your requirements.

It is a great convenience and you can save money by buying all of your Valves and Fittings from this 75 year old company.

We will be pleased to send you catalog of complete line upon request.

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Erie, Penna., U. S. A.

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AVONMORE, PA.

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Ingersoll-Rand Co., 11 Broadway, New York City.
Spencer Turbine Co., Hartford, Conn.
Sullivan Machinery Co., 78 E. Adams St., Chicago, Ill.

COMPRESSORS (Portable)
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill.
Ingersoll-Rand Co., 11 Broadway, New York City.

CONCRETE ARMORING (Surface)
Irving Iron Works, Long Island City, N. Y.

CONCRETE FLOOR SLABS
American Cement Tile Mfg. Co., Oliver Bldg., Pittsburgh, Pa.

CONCRETE MIXERS—See MIXERS (Concrete)

CONCRETE REINFORCING BARS—See BARS (Concrete Reinforcing)

CONCRETE REINFORCEMENT
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.

CONCRETE ROOFING TILE
American Cement Tile Mfg. Co., Oliver Bldg., Pittsburgh, Pa.

CONCRETE WATERPROOFING
Celite Products Co., 1320 S. Hope St., Los Angeles, Cal.

CONDENSATION MATERIAL (Laminated Phenolic)
Fibroc Insulation Co., Valparaiso, Ind.

CONDENSERS (Surface, Barometric, Multi-Jet)
Ingersoll-Rand Co., 11 Broadway, New York City.

CONDUITS (Electric)
Youngstown Sheet & Tube Co., Youngstown, O.

CONNECTING RODS
Leard, William, Co., New Brighton, Pa.
Transue & Williams Steel Forging Corp., Alliance, O.

CONTRACTORS—See ENGINEERS AND CONTRACTORS

CONTROLLERS (Automatic)
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland, O.

CONTROLLERS (Electric)
Clark Controller Co., The, 1146 E. 152nd St., Cleveland, O.
Cutler-Hammer Mfg. Co., The, Milwaukee, Wis.
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland, O.

CONTROLLERS (Electric Crane)
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland, O.

CONTROLLERS (Motor)
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland, O.

CONVEYORS (Elevating and Conveying)
Bartlett, C. O., & Snow Co., 6213 Harvard Ave., Cleveland, O.
Brown Hoisting Machinery Co., 4403 St. Clair Ave., Cleveland, O.
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.

COOLERS (Copper)
Lawrenceville Bronze Co., 518 Bessemer Bldg., Pittsburgh, Pa.

COOLING BEDS
Morgan Construction Co., Worcester, Mass.

COPPER
Copper & Brass Research Assn., 25 Broadway, New York City.

COPPER AND BRASS DRAWING MACHINERY
Vaughn Machinery Co., The, Cuyahoga Falls, O.

CORE MAKING MACHINES
American Foundry Equipment Co., 407 Byrkit Ave., Mishawaka, Ind.

COTTER PINS
Hindley Mfg. Co., John St., Valley Falls, R. I.

COTTERS
Kirk-Latty Co., 1971 W. 85th St., Cleveland, O.
Lamson & Sessions Co., The, 2188 Scranton Rd., Cleveland, O.

COUNTING MACHINES
Veeder Mfg. Co., Hartford, Conn.

COUPLINGS (Carriage)
Bradley, C. C., & Son, Inc., 432 N. Franklin St., Syracuse, N. Y.

COUPLINGS (Flexible)
Clark Controller Co., The, 1146 E. 152nd St., Cleveland, O.
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland, O.
Farrel Foundry & Machine Co., Buffalo, N. Y.

CRANES
Bedford Foundry & Machine Co., Bedford, Ind.
Cyclops Iron Works, 837 Folsom St., San Francisco, Calif.
Milwaukee Electric Crane & Mfg. Co., Milwaukee, Wis.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.

CRANES (All Types)
Whiting Corp., Harvey, Ill.

CRANES (Charging)
Alliance Machine Co., The, Alliance, O.
Morgan Engineering Co., Alliance, O.
Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O.

CRANES (Crawling, Tractor, Erection)
Brown Hoisting Machinery Co., 4403 St. Clair Ave., Cleveland, O.
Harnischfeger Corp., 3811 National Ave., Milwaukee, Wis.
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.
Orton Crane & Shovel Co., 608 S. Dearborn St., Chicago, Ill.

CRANES (Electric, Industrial, Truck Mounted)
Baker-Raulang Co., The, 2183 W. 25th St., Cleveland, O.

CRANES (Electric Traveling)
Alliance Machine Co., The, Alliance, O.
Armstrong, Sir W. G., Whitworth & Co., Ltd., Kinnaird House, Pall Mall East, London, S. W. 1, England.
Box Crane & Hoist Corp., Janney and E. Ontario Sts., Philadelphia, Pa.
Cleveland Crane & Engrg. Co., The, Wickliffe, O.
Harnischfeger Corp., 3811 National Ave., Milwaukee, Wis.
Milwaukee Electric Crane & Mfg. Corp., Milwaukee, Wis.
Morgan Engineering Co., The, Alliance, O.
Niles-Bement-Pond Co., 111 Broadway, New York City.
Roeper Crane & Hoist Works, 1729 No. 10th St., Reading Pa.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.

CRANES (Gantry)
Bedford Foundry & Machine Co., Bedford, Ind.
Cleveland Crane & Engineering Co., The, Wickliffe, O.
Milwaukee Electric Crane & Mfg. Co., Milwaukee, Wis.
Whiting Corp., Harvey, Ill.

CRANES (Hand)
Cleveland Electric Tramrail, Division of the Cleveland Crane & Engineering Co., Wickliffe, O.
Roeper Crane & Hoist Works, 1729 No. 10th St., Reading, Pa.

CRANES (Hydraulic)
Alliance Machine Co., The, Alliance, O.

CRANES (Jib)
Cleveland Electric Tramrail, Division of the Cleveland Crane & Engineering Co., Wickliffe, O.
Niles-Bement-Pond Co., 111 Broadway, New York City.

CRANES (Locomotive)
Brown Hoisting Machinery Co., 4403 St., Clair Ave., Cleveland, O.
Browning Crane Co., E. 162nd and Waterloo Rd., Cleveland, O.
Harnischfeger Corp., 3811 National Ave., Milwaukee, Wis.
Orton Crane & Shovel Co., 608 S. Dearborn St., Chicago, Ill.

CRANES (Motor Truck)
Browning Crane Co., 162nd and Waterloo Rd., Cleveland, O.

CRANES (Portable)
Beatty Machine & Mfg. Co., Hammond, Ind.

CRANES (Wall)
Milwaukee Electric Crane & Mfg. Corp., Milwaukee, Wis.
Niles-Bement-Pond Co., 111 Broadway, New York City.

CRANK SHAFTS
Champion Machine & Forging Co., The, 3675 E. 78th St., Cleveland, O.
Transue & Williams Steel Forging Corp., Alliance, O.

CRIMPING MACHINES
Streine Tool & Mfg. Co., The, New Bremen, O.

CRUSHING, GRINDING AND PULVERIZING MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Morgan Engineering Co., Alliance, O.

CUPRO-VANADIUM
Vanadium Corp. of America, 120 Broadway, New York City.

CUTTING AND WELDING APPARATUS—See WELDING AND CUTTING APPARATUS (Electric)

CUTTING AND WELDING (Oxy-Acetylene Process)—See WELDING AND CUTTING APPARATUS AND SUPPLIES (Oxy-Acetylene Process)

CYLINDERS (Acetylene) — See ACETYLENE IN CYLINDERS

CYLINDERS (Oxygen) — See OXYGEN IN CYLINDERS

CYLINDERS (Pressure)
National Tube Co., Frick Bldg., Pittsburgh, Pa.

DECARBONIZING APPARATUS
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

DEOXIDIZERS
Titanium Alloy Mfg. Co., The, Niagara Falls, N. Y.

DERRICKS
American Terry Derrick Co., South Kearney, N. J.

DIE BLOCKS
Bethlehem Steel Co., Bethlehem, Pa.
Heppenstall Forge & Knife Co., 47th and Hatfield Sts., Pittsburgh, Pa.
Strong Steel Foundry Co., 33 Norris St., Buffalo, N. Y.

DIE CASTINGS
Doehler Die Casting Co., Ninth and Court Cts., Brooklyn, N. Y.

DIE CASTINGS (Tin, Aluminum and Zinc Base Alloys)
Doehler Die Casting Co., Ninth and Court Sts., Brooklyn, N. Y.

DIE CUSHIONS (Pneumatic)
Marquette Tool & Mfg. Co., 1908 N. Kilbourne Ave., Chicago, Ill.

DIE HEADS (Automatic)
Landis Machine Co., Waynesboro, Pa.

DIE HEADS (Self-Opening)
National Acme Co., E. 131st St. & Coit Rd., Cleveland, Ohio.
Rickert-Shafer Co., Dept. T. M., Erie, Pa.

DIES
Barth Stamping & Machine Works, 3814 W. 34th St., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Niagara Machine & Tool Works, 685 Northland Ave., Buffalo, N. Y.
Toledo Machine & Tool Co., Toledo, O.
Vanadium Corp. of America, 120 Broadway, New York City.

DIES, DEEP DRAWING ATTACHMENTS
Marquette Tool & Mfg. Co., 1908 N. Kilbourne Ave., Chicago, Ill.

DIES (Riveters)
Marchant, George F., Co., 1434 So. Rockwell St., Chicago, Ill.

DISPENSERS (Die Cast)
Doehler Die Casting Co., Ninth and Court Sts., Brooklyn, N. Y.

DOORS AND SHUTTERS (Steel, Fire and Rolling)
Kinnear Mfg. Co., 818-868 Field Ave., Columbus, O.
Moeschl-Edwards Const. Co., The, 120 W. 9th St., Covington, Ky.

DRAFTING ROOM EQUIPMENT
Pease, The C. F., Co., 853 N. Franklin St., Chicago, Ill.

DRAW BENCHES
Aetna-Standard Engineering Co., The, Youngstown, O.

DRAW BENCHES (Wire)
Vaughn Machinery Co., Cuyahoga Falls, O.

DRAWING INSTRUMENTS AND DRAWING MATERIALS
Pease, The C. F., Co., 853 N. Franklin St., Chicago, Ill.

DRILLING MACHINES (Automatic)
Barnes Drill Co., Rockford, Ill.

DRILLING MACHINES (Vertical and Gang)
Barnes Drill Co., Rockford, Ill.

DRILLS (Electric)
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill.

DRILLS (Pneumatic)
Cleveland Pneumatic Tool Co., 3734 E. 78th St., Cleveland, O.
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill.
Ingersoll-Rand Co., 11 Broadway, New York City.

DRILLS (Rock)
Chicago Pneumatic Tool Co., 6 E. 44th St., New York City.
Ingersoll-Rand Co., 11 Broadway, New York City.

DRIVE SCREWS (Hardened Metallic)
Parker-Kalon Corp., 358 W. 13th St., New York City.

DRIVES (Cut Herringbone Gears)
Farrel Foundry & Machine Co., Buffalo, N. Y.
Mackintosh-Hemphill Co., 12th and Etna Sts., Pittsburgh, Pa.
Strong Steel Foundry Co., 33 Norris St., Buffalo, N. Y.

DRIVES (Gear, Rope)
Mesta Machine Co., Homestead, Pa.

DRYERS (Sand, Coal, Ores, Chemical, Etc.)
Bartlett, C. O., & Snow Co., 6213 Harvard Ave., Cleveland, O.

DUST ARRESTERS
Pangborn Corp., P. O. Box 858, Hagerstown, Md.

DUST COLLECTING EQUIPMENT
Midwest Air Filters, Inc., Bradford, Pa.

ELECTRICAL EQUIPMENT
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Clark Controller Co., The, 1146 E. 152nd St., Cleveland, O
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland, O.
General Electric Co., Schenectady, N. Y.

ELECTRIC TOOLS (Portable)—See TOOLS (Portable Electric)

ELEVATING AND CONVEYING MACHINERY—See CONVEYORS (Elevating and Conveying)

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

LEWIS

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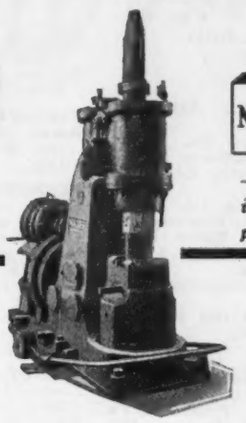

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ELEVATORS (Bucket)
Bartlett, C. O., & Snow Co., 6213 Harvard Ave., Cleveland, O.
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.

ENGINE LATHES—See LATHES (Engine)

ENGINES (Gas, Oil)
Chicago Pneumatic Tool Co., 6 E. 44th St., New York City.
Ingersoll-Rand Co., 11 Broadway, New York City.

ENGINES (Heavy Duty)
Mesta Machine Co., Homestead, Pa.

ENGINEERS AND CONTRACTORS
Brassert, H. A., & Co., 310 So. Michigan Ave., Chicago Ill.
Chapman Engineering Co., Mt. Vernon, O.
Costello Engineering Co., 519 Oliver Bldg., Pittsburgh, Pa.
Hires, Castner and Harris, Inc., 25th and Morris Sts., Philadelphia, Pa.
Kennedy, Julian, Bessemer Bldg., Pittsburgh, Pa.
Laughlin, Alex, & Co., First National Bank Bldg., Pittsburgh, Pa.
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.
Moore, W. E., & Co., Foot of 32nd St., Pittsburgh, Pa.
Phoenix Bridge Co., 20 South 15th St., Philadelphia, Pa.
Pittsburgh Valve, Foundry & Construction Co., 26th & A. V. Ry., Pittsburgh, Pa.
Smythe, S. R., Co., The, House Bldg., Pittsburgh, Pa.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.
Swindell, Wm., & Bros., P. O. Box. 1753, Pittsburgh, Pa.

ENGINEERS (Consulting)
Brassert, H. A., & Co., 310 So. Michigan Ave., Chicago, Ill.
Kennedy, Julian, Bessemer Bldg., Pittsburgh, Pa.
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.
Moore, W. E., & Co., Foot of 32nd St., Pittsburgh, Pa.
Perin & Marshall, 40 West 40th St., New York City.
Shover, Barton R., 424 Oliver Bldg., Pittsburgh, Pa.

ENGINEERS, CONSULTING (By-Product Coke Oven and Gas Plants)
Koppers Construction Co., The, Union Trust Bldg., Pittsburgh, Pa.

EXHAUST FANS (Acid Resisting)
Duriron Co., Inc., The, Dayton, O.

EXHAUSTERS (Gas)—See GAS EXHAUSTERS

FACTORY EQUIPMENT (Steel)—See STOOLS AND FACTORY EQUIPMENT (Steel)

FACTORY SPECIALISTS
Fantus Factory Locating Service, 1325 S. Oakley St., Chicago, Ill.
Houston, David, Bond & Co., Inc., Military Park Bldg., 60 Park Place, Newark, N. J.
Technical Service Co., 233 Broadway, New York City.

FELTS (Wool Mechanical)
Booth Felt Co., Inc., The, 464 18th St., Brooklyn, N. Y.

FENCES—See WIRE FENCES

FERROALLOYS
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
Keokuk Electro-Metals Co., Keokuk, Iowa.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Leavitt, C. W., & Co., 30 Church St., New York City.
Metal & Thermit Corp., 120 Broadway, New York City.

FERROCARBON TITANIUM
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

FERROCHROME
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Leavitt, C. W., & Co., 30 Church St., New York City.
Rogers Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.
Samuel, Frank, & Co., Harrison Bldg., Philadelphia, Pa.

FERROPHOSPHORUS
Rogers Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.

FERROSILICON
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
Globe Iron Co., Jackson, O.
Keokuk Electro-Metals Co., Keokuk, Iowa.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Rogers Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.

FERROVANADIUM
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
Vanadium Corp. of America, 120 Broadway, New York City.

FILTERS (Air)
Midwest Air Filters, Inc. Bradford, Pa.

FIRE BRICK AND CLAY
Ashland Fire Brick Co., Ashland, Ky.
Botfield Refractories Co., Swanson and Clymer Sts., Philadelphia, Pa.
Brighton Fire Brick Co., Block House Run, New Brighton, Pa.
Climax Fire Brick Co., Climax, Pa.
Crescent Refractories Co., Curwensville, Clearfield Co., Pa.
Dover Fire Brick Co., 1012 Nat'l City Bank Bldg., Cleveland, O.
Elk Fire Brick Co., St. Marys, Pa.
Eureka Fire Brick Works, First National Bank Bldg., Pittsburgh, Pa.
Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittsburgh, Pa.
Haws Refractories Co., Johnstown, Pa.
Hydraulic Press Brick Co., Central National Bank Bldg., St. Louis, Mo.
Kier Fire Brick Co., Oliver Bldg., Pittsburgh, Pa.
Laclede-Christy Clay Products Co., St. Louis, Mo.
Morgan Run Mining Co., Box D-1, Clearfield, Pa.
Portsmouth Refractories Co., Portsmouth, O.
Queen's Run Refractories Co., Inc., Lock Haven, Pa.
Savage Mountain Fire Brick Co., Frostburg, Md.
Taylor, Chas., Sons Co., The, Burns St., Cincinnati, Ohio.
Union Mining Co., 1113 Fidelity Bldg., Baltimore, Md.
Walsh Fire Clay Products Co., 4070 N. Main St., St. Louis, Mo.

FIRE CLAY (Ground)
General Refractories Co., 117 S. 16th St., Philadelphia, Pa.
U. S. Refractories Corp., Mt. Union, Pa.

FIRE DOORS AND SHUTTERS
Kinnear Mfg. Co., The, 818-868 Field Ave., Columbus, O.
Moeschl-Edwards Const. Co., The, 120 W. 9th St., Covington, Ky.

FLANGES (Pipe)
Dart, E. M., Mfg. Co., Providence, R. I.

FLASKS (Snap)
American Foundry Equipment Co., 407 Byrkit Ave., Mishawaka, Ind.
Diamond Clamp & Flask Co., Richmond, Ind.

FLOORING (Steel, Ventilating, Nonslipping, Fireproof)
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.
Irving Iron Works, Long Island City, N. Y.

FLOOR PLATES (Rolled Steel)—See PLATES (Rolled Steel—Floor)

FLUORSPAR
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Rogers Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.

FLUX (Welding)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

FORGES
Bradley, C. C., & Son, Inc., 432 N. Franklin St., Syracuse, N. Y.

FORGING BILLETS—See BILLETS (Forging)

FORGING FURNACES
Best, W. N., Corp., Sixth Ave. and 31st St., New York City.
Chapman-Stein Furnace Co., Mt. Vernon, O.
Surface Combustion Co., 366 Gerard Ave., New York City.

FORGING MACHINERY
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Bradley, C. C., & Son., Inc., 432 N. Franklin St., Syracuse, N. Y.

FORGINGS (Brass, Bronze and Copper)
American Brass Co., 25 Broadway, New York City.

FORGINGS (Drop)
Bay City Forge Co., Erie, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Canton Forge & Axle Co., 2001-2037 Dueber Ave., Canton, O.
Champion Machine & Forging Co., 3675 E. 78th St., Cleveland, O.
Drop Forging Co. of New York, 324 West Side Ave., Jersey City, N. J.
Eagle Bolt & Forging Co., The, 1435 E. 45th St., Cleveland, O.
Fruin Drop Forge Co., 343 West Root St., Chicago, Ill.
Heppenstall Forge & Knife Co., 47th & Hatfield Sts., Pittsburgh, Pa.
Oliver Iron & Steel Corp., So. 10th and Muriel Sts. Pittsburgh, Pa.
Philadelphia Steel & Iron Co., Commercial Trust Bldg., Philadelphia, Pa.
Queen City Forging Co., The, 235 Tennyson St., Cincinnati, O.
Rockford Drop Forge Co., Rockford, Ill.
Strieby & Foote Co., 301 Ogden St., Newark, N. J.
Transue & Williams Steel Forging Corp., Alliance, O.
Wilcox, D., Mfg. Co., Mechanicsburg, Pa.
Williams, J. H., & Co., 400 Vulcan St., Buffalo, N. Y.

FORGINGS (Hollow Bored)
American Hollow Boring Co., 1055 W. 19th St., Erie, Pa.
National Forge & Ordnance Co., Irvine, Warren Co., Pa.

FORGINGS (Iron and Steel)
Bay City Forge Co., Erie, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Bradley, C. C., & Son, Inc., 432 N. Franklin St., Syracuse, N. Y.
Drop Forging Co. of New York, 324 West Side Ave., Jersey City, N. J.
Heppenstall Forge & Knife Co., 47th and Hatfield Sts., Pittsburgh, Pa.
Leard, Wm., Co., The, New Brighton, Pa.
Mesta Machine Co., Homestead, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
National Forge & Ordnance Co., Irvine, Warren Co., Pa.
Philadelphia Steel & Iron Co., Commercial Trust Bldg., Philadelphia, Pa.
Rockford Drop Forge Co., Rockford, Ill.
Tioga Steel & Iron Co., 52nd and Grays Ave., Philadelphia, Pa.
Transue & Williams Steel Forging Corp., Alliance, O.
Vanadium Corp. of America, 120 Broodway, New York City.
Wilcox, D., Mfg. Co., Mechanicsburg, Pa.
Williams, J. H., & Co., 400 Vulcan St., Buffalo, N. Y.

FORGINGS (Upset)
Neely Nut & Bolt Co., 2101 Wharton St., Pittsburgh, Pa.

FOUNDRY EQUIPMENT AND SUPPLIES
American Foundry Equipment Co., 407 Byrkit Ave., Mishawaka, Ind.
National Engineering Co., 549 W. Washington Blvd., Chicago, Ill.
Whiting Corp., Harvey, Ill.

FRAMES (Wire Drawing)
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., The, Cuyahoga Falls, O.

FROGS AND SWITCHES
Bethlehem Steel Co., Bethlehem, Pa.

FUEL OIL BURNING SYSTEMS AND PLANTS
Best, W. N., Corp., Sixth Ave. and 31st St., New York City.
Fuller Lehigh Co., Fullerton, Pa.

FURNACE INSULATION
Armstrong Cork & Insulation Co., 101 24th St., Pittsburgh, Pa.
Celite Products Co., 11 Broadway, New York City.
Quigley Furnace Specialties Co., 26 Cortlandt St., New York City.

FURNACES (Annealing, Case Hardening and Heat Treating)
American Gas Furnace Co., Spring & Lafayette Sts., Elizabeth, N. J.
Best, W. N., Corp., Sixth Ave. and 31st St., New York City.
Chapman-Stein Furnace Co., Mt. Vernon, O.
Costello Engineering Co., 519 Oliver Bldg., Pittsburgh, Pa.
Hagan, George J., Chamber of Commerce Bldg., Pittsburgh, Pa.
Strong, Carlisle & Hammond Co., The, 1392 W. 3rd St., Cleveland, O.
Surface Combustion Co., 366 Gerard Ave., New York City.

FURNACES (Blast)
Brassert, H. A., & Co., 310 So. Michigan Ave., Chicago, Ill.
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.
Mt. Vernon Bridge Co., Mt. Vernon, O.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.

FURNACES (Continuous Pair)
Hagan, Geo. J., Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
Surface Combustion Co., 366 Gerard Ave., New York City.

FURNACES (Electric)
Hagan, George J., Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
Strong, Carlisle & Hammond Co., The, 1392 W. 3rd St., Cleveland, O.
Swindell, Wm., & Brothers Co., P. O. Box 1753, Pittsburgh, Pa.

FURNACES (Electric Melting)
American Bridge Co., 71 Broadway, New York City.
General Electric Co., Schenectady, N. Y.
Hagan, George J., Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
Payne, N. B., & Co., 25 Church St., New York City.
Pittsburgh Electric Furnace Co., 32nd St. and Putney Way, Pittsburgh, Pa.

FURNACES (Open-Hearth)
Laughlin, Alex, & Co., First National Bank Bldg., Pittsburgh, Pa.
Smythe, S. R., Co., Oliver Bldg., Pittsburgh, Pa.
Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O.

FURNACES (Porcelain Enameling)
Ferro Enamel Supply Co., The, Keith Bldg., Cleveland, O.

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Keeping down the cost of Spring Production—

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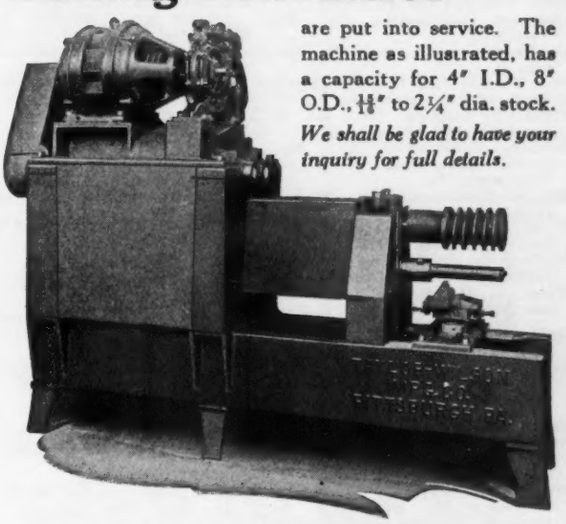

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Hagan, Geo. J., Co., Chamber of Commerce Bldg., Pittsburgh, Pa.

FURNACES (Sheet and Tin Mill)
Costello Engineering Co., 519 Oliver Bldg., Pittsburgh Pa.
Surface Combustion Co., 366 Gerard Ave., New York City.

FURNACES (Steel Mill)
Rust Engineering Co., 311 Ross St., Pittsburgh, Pa.

GAGES (Welding)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

GAGGERS
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Franklin Core Rod & Gagger Co., Franklin, Pa.

GALVANIZING
Cattie Brothers Corp., Tioga St., Philadelphia, Pa.
Cattie, Joseph P., & Brothers, Gaul & Letterly Sts., Philadelphia, Pa.
Hanlon-Gregory Galvanizing Co., 5515 Butler St., Pittsburgh, Pa.

GALVANIZING (Hot Dip)
Cattie, Joseph P., & Brothers, Gaul & Letterly Sts., Philadelphia, Pa.
Gray-Gregory Galvanizing Co., 220 Larkin St., Buffalo, N. Y.
Hanlon-Gregory Galvanizing Co., 5515 Butler St., Pittsburgh, Pa.

GALVANIZING PLANTS (For Sheets)
Erie Foundry Co., Erie, Pa.
United Enginering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

GALVANIZING POTS
Pittsburgh Annealing Box Co., 801 Beaver Ave., N.S., Pittsburgh, Pa.

GAS (Welding and Cutting)
Prest-O-Lite Co., Inc., The, 30 E. 42nd St., New York City.

GAS BOOSTERS (Rotary Positive Pressure)
Connersville Blower Co., The, Connersville, Ind.
Roots, P. H. & F. M., Co., Connersville, Ind.

GAS EXHAUSTERS
Connersville Blower Co., The, Connersville, Ind.
Roots, P. H. & F. M., Co., Connersville, Ind.

GAS METERS — See METERS (Gas, Air)

GAS PRODUCER PLANTS
Chapman Engineering Co., Mt. Vernon, O.
Cooper, C. & G., Co., Mt. Vernon, O.
Duff Patents Co., Inc., 321 Union Trust Bldg., Pittsburgh, Pa.
Flinn & Dreffein Co., 435 S. Dearborn St., Chicago, Ill.
Koppers Construction Co., The, Union Trust Bldg., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
U. S. Cast Iron Pipe & Foundry Co., Burlington, N. J.
Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O.
Wood, R. D., & Co., 400 Chestnut Ave., Philadelphia, Pa.

GAS RECOVERY COKE OVEN AND GAS PLANTS
Koppers Construction Co., The, Union Trust Bldg., Pittsburgh, Pa.

GEAR BLANKS
Bethlehem Steel Co., Bethlehem, Pa.
Buffalo Bronze Die Cast Corp., 100 Arthur St., Buffalo, N. Y.
Strong Steel Foundry Co., 33 Norris St., Buffalo, N. Y.
Transue & Williams Steel Forging Corp., Alliance, Ohio.

GEAR GENERATORS
Farrel Foundry & Machine Co., Buffalo, N. Y.

GEARS (Bakelite)
Albaugh-Dover Mfg. Co., 2154 Marshall Blvd., Chicago, Ill.
Chicago Rawhide Mfg. Co., The, 1305 Elston Ave., Chicago, Ill.
Fibroc Insulation Co., Valparaiso, Ind.

GEARS (Bevel-Generated Tooth)
Albaugh-Dover Mfg. Co., 2154 Marshall Blvd., Chicago, Ill.

GEARS (Cast Steel)
Stroh Steel Hardening Process Co., Westinghouse Bldg., Pittsburgh, Pa.

GEARS (Herringbone)
Farrel Foundry & Machine Co., Buffalo, N. Y.
Fawcus Machine Co., 2818 Smallman St., Pittsburgh, Pa.

GEARS (Machine Molded)
Jones, W. A., Foundry & Machine Co., 4437 W. Roosevelt Ave., Chicago, Ill.
Taylor-Wilson Manufacturing Co., McKees Rocks, Pa.

GEARS (Miter, Ring, Spiral, Worm)
Albaugh-Dover Mfg. Co., 2154 Marshall Blvd., Chicago, Ill.
Chicago Gear Mfg. Co., 2827 Fulton St., Chicago, Ill.
Philadelphia Gear Works, E. Tioga, Philadelphia, Pa.

GEARS (Rawhide)
Albaugh-Dover Mfg. Co., 2154 Marshall Blvd., Chicago, Ill.
Chicago Rawhide Mfg. Co., 1305 Elston Ave., Chicago, Ill.

GEARS (Reverse Marine)
General Electric Co., Schenectady, N. Y.
Johnson, Carlyle, Machine Co., Manchester, Conn.

GEARS AND GEAR CUTTING
Albaugh-Dover Mfg. Co., 2154 Marshall Blvd., Chicago, Ill.
American Adamite Co., The, 12th and Etna Sts., Pittsburgh, Pa.
Chicago Gear Mfg. Co., 2827 Fulton St., Chicago, Ill.
Farrel Foundry & Machine Co., Buffalo, N. Y.
Fawcus Machine Co., 2818 Smallman St., Pittsburgh, Pa.
Johnson, Carlyle, Machine Co., Manchester, Conn.
Mackintosh-Hemphill Co., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
Niles-Bement-Pond Co., 111 Broadway, New York City.
Ross-Meehan Foundries, Chattanooga, Tenn.
Simonds Mfg. Co., 25th St. and Liberty Ave., Pittsburgh, Pa.
Stroh Steel Hardening Process Co., Westinghouse Bldg., Pittsburgh, Pa.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

GENERATING SETS
General Electric Co., Schenectady, N. Y.

GENERATORS (Acetylene) — See ACETYLENE GENERATORS

GENERATORS (Direct and Alternating Current)
General Electric Co., Schenectady, N. Y.

GENERATORS (Electric)
Lincoln Electric Co., The, Coit Rd. and Kirby Ave., Cleveland, O.

GLOVES (Asbestos)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

GLOVES (Steel Grip)
Industrial Gloves Corp., 1213 Fullerton Ave., Chicago, Ill.

GOGGLES (Welding)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

GRATING-STEEL (Subway, Area, Sidewalk, Ventilation, Non-Slipping)
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.
Irving Iron Works, Long Island City, N. Y.

GRILLES
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.

GRINDERS (Crankshaft)
Landis Tool Co., Waynesboro, Pa.

GRINDERS (Electric - Pneumatic Portable)
Cleveland Pneumatic Tool Co., 3734 E. 78th St., Cleveland, O.
Ingersoll-Rand Co., 11 Broadway, New York City.

GRINDERS (Pneumatic)
Sullivan Machinery Co., 78 E. Adams St., Chicago, Ill.

GRINDERS (Roll)
Farrel Foundry & Machine Co., Ansonia, Conn.
Landis Tool Co., Waynesboro, Pa.
Norton Co., Worcester, Mass.

GRINDING MACHINES
Farrell-Cheek Steel Foundry Co., Sandusky, O.
Landis Tool Co., Waynesboro, Pa.
Norton Co., Worcester, Mass.
Ransom Mfg. Co., Oshkosh, Wis.

GRINDING PANS
Hadfield-Penfield Steel Co., The, Bucyrus, Ohio.
National Engineering Co., 549 W. Washington Blvd., Chicago, Ill.
Phillips & McLaren Co., 24th & Smallman Sts., Pittsburgh, Pa.

GRINDING WHEELS
Norton Co., Worcester, Mass.

GUARDS (Machinery)
Breese Bros. Co., The, 2347 Reading Rd., Cincinnati, O.

GUARDS (Truck Radiator)
Irving Iron Works, Long Island City, N. Y.

GUNS (Refractory)
Botfield Refractories Co., Swanson & Clymer Sts., Philadelphia, Pa.

HAMMERS (Board Drop)
Erie Foundry Co., Erie, Pa.
Ingersoll-Rand Co., 11 Broadway, New York City.

HAMMERS (Chipping, Riveting and Calking)
Cleveland Pneumatic Tool Co., 3734 E. 78th St., Cleveland, O.
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill.
Ingersoll-Rand Co., 11 Broadway, New York City.

HAMMERS (Drop)
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Chambersburg Engineering Co., Chambersburg, Pa.
Erie Foundry Co., Erie, Pa.
Morgan Engineering Co., Alliance, Ohio.
Niles-Bement-Pond Co., 111 Broadway, New York City.
Toledo Machine & Tool Co., Toledo, O.

HAMMERS (Power)
Bradley, C. C., & Son, Inc., 432 No. Franklin St., Syracuse, N. Y.
Erie Foundry Co., Erie, Pa.
Niles-Bement-Pond Co., 111 Broadway, New York City.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.

HAMMERS (Steam)
Chambersburg Engineering Co., Chambersburg, Pa.
Erie Foundry Co., Erie, Pa.
Morgan Engineering Co., Alliance, O.

HANGERS (Door)
Myers, F. E., & Brothers Co., The, Ashland, Ohio.

HANGERS (Shaft)
Hyatt Roller Bearing Co., Newark, N. J.

HARDNESS TESTING MACHINES
Shore Instrument & Mfg. Co., Van Wyck Ave. & Carll St., Jamaica, N. Y.

HEAT TREATING (Commercial)
Lakeside Steel Improvement Co., The, 5418 Lakeside Ave., Cleveland, O.

HOISTING MACHINERY
American Terry Derrick Co., So. Kearney, N. J.
Brown Hoisting Machinery Co., 4403 St. Clair Ave., Cleveland, O.
Illinois Malleable Iron Co., 1801 Diversey Blvd., Chicago, Ill.
Orton Crane & Shovel Co., 608 S. Dearborn St., Chicago, Ill.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.
Sprague Electric Hoist Division of the Shepard Electric Crane & Hoist Co., 30 Church St., New York City.
Treadwell Engineering Co., Easton, Pa.

HOISTS (Electric)
Box Crane & Hoist Corp., Janney & Ontario Sts., Philadelphia, Pa.
Cleveland Electric Tramrail, Division of the Cleveland Crane & Engineering Co., Wickliffe, O.
General Electric Co., Schenectady, N. Y.
Harnischfeger Corp., 3811 National Ave., Milwaukee, Wis.
Milwaukee Electric Crane & Mfg. Corp., Milwaukee, Wis.
Roeper Crane & Hoist Works, 1729 No. 10th St., Reading, Pa.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.
Sprague Electric Hoist Division of the Shepard Electric Crane & Hoist Co., 30 Church St., New York City.

HOISTS (Pneumatic)
Hanna Engineering Works, 1766 Elston Ave., Chicago, Ill.
Ingersoll-Rand Co., 11 Broadway, New York City.
Sullivan Machinery Co., 78 E. Adams St., Chicago, Ill

HOISTS (Portable)
Sullivan Machinery Co., 78 E. Adams St., Chicago, Ill

HOOPS AND BANDS
Acme Steel Co., 2840 Archer Ave., Chicago, Ill.
Ryerson, Joseph T., & Son, Inc. 16th and Rockwell Sts., Chicago, Ill.
West Leechburg Steel Co., Farmers Bank Bldg., Pittsburgh, Pa.

HOOPS AND BANDS (Strips)
Sharon Steel Hoop Co., Sharon, Pa.

HOSE (Welding)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

HOT BEDS
McKee, Willis, 2422 Euclid Ave., Cleveland, Ohio.
Morgan Construction Co., Worcester, Mass.
Treadwell Engineering Co., Easton, Pa.

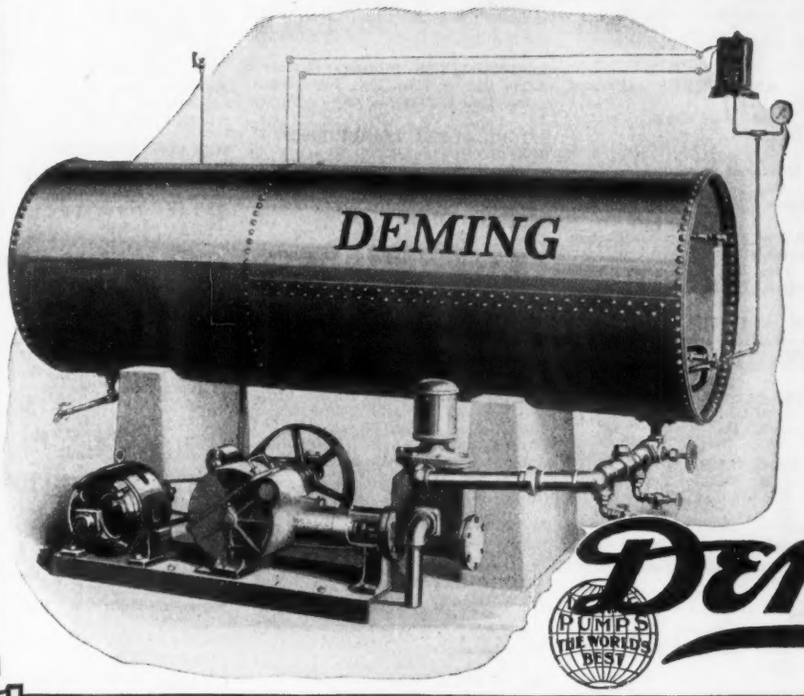
HOT BLAST STOVES
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.

HYDRANTS (Fire)
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

HYDRAULIC MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Bethlehem Steel Co., Bethlehem, Pa.
Chambersburg Engineering Co., Chambersburg, Pa.
Morgan Engineering Co., Alliance, O.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

START IT AND FORGET IT!



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Est. 1880

Salem, Ohio

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HAMMER WELDED IN THE PROPER WAY

TIN POTS
ANNEALING BOXES
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PITTSBURGH ANNEALING BOX CO.
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PITTSBURGH, PA.

ALLIS-CHALMERS

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Power and Electrical Machinery, Steam, Gas and Oil Engines, Centrifugal Pumps, Condensers, Air Compressors, Power Transmission Machinery, Dust Collectors, etc.

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PITTSBURGH, PA.

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Inserted Tooth; Solid Tooth; Milling; Hot

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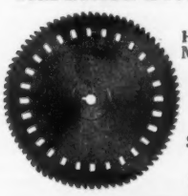

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GITS BROS.

Better Oilers

287 *Styles & Sizes*

GITS BROS MFG. CO.
1940 S. Kilbourn Chicago.

HYDRAULIC PRESSES — See PRESSES (Hydraulic)

INDUSTRIAL HAULAGE EQUIPMENT
General Electric Co., Schenectady, N. Y.

INGOT MOLDS
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Penn Mold & Mfg. Co., Wheeling, W. Va.
Valley Mould & Iron Corp., Sharpsville, Pa.

INSTRUMENTS (Electric, Indicating and Recording)
General Electric Co., Schenectady, N. Y.

INSULATING BLOCK
Armstrong Cork & Insulation Co., 101 24th St., Pittsburgh, Pa.

INSULATING BRICK
Armstrong Cork & Insulation Co., 101 24th St., Pittsburgh, Pa.
Celite Products Co., 1320 So. Hope St., Los Angeles, Calif.
Quigley Furnace Specialties Co., 26 Cortlandt St., New York City.

INSULATING POWDER AND CEMENT
Armstrong Cork & Insulation Co., 101 24th St., Pittsburgh, Pa.
Celite Products Co., 1320 So. Hope St., Los Angeles, Calif.

INSULATION (Furnace, Boiler Settings, Ovens, Steam Pipe, Etc.)
Armstrong Cork & Insulation Co., 101 24th St., Pittsburgh, Pa.
Celite Products Co., 1320 So. Hope St., Los Angeles, Calif.
Quigley Furnace Specialties Co., 26 Cortlandt St., New York City.

IRON
Interstate Iron & Steel Co., 104 So. Michigan Ave., Chicago, Ill.
Newport Rolling Mill Co., Newport, Ky.

IRON (Bar)
Bethlehem Steel Co., Bethlehem, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.

IRON (Chain)
Bethlehem Steel Co., Bethlehem, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Penn Iron & Steel Co., Creighton, Pa.

IRON (Engine Bolt)
Bethlehem Steel Co., Bethlehem, Pa.
Penn Iron & Steel Co., Creighton, Pa.

IRON (Norway & Swedish)
Brown-Wales Co., 493 C St., Boston, Mass.
Stahleker Steel Corp., 19 Congress St., Boston, Mass.

IRON (Silvery)
Globe Iron Co., Jackson, O.
Keokuk Electro-Metals Co., Keokuk, Iowa.

IRON (Stainless)
Allegheny Steel Co., Brackenridge, Pa.
Firth-Sterling Steel Co., McKeesport, Pa.

IRON (Staybolt)
Bethlehem Steel Co., Bethlehem, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Penn Iron & Steel Co., Creighton, Pa.

IRON ORE
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.
Hanna, The M. A., Co., Leader Bldg., Cleveland, O.
Hillman Coal & Coke Co., First National Bank Bldg., Pittsburgh, Pa.
Park & Williams, Inc., Real Estate Trust Bldg., Philadelphia, Pa.
Pickands, Mather & Co. Union Trust Bldg., Cleveland, O.
Quinn, Clement K., & Co., Duluth, Minn.
Samuel, Frank, & Co., Harrison Bldg., Philadelphia, Pa.
Snyder, W. P., & Co., Oliver Bldg., Pittsburgh, Pa.

JOISTS AND STUDS (Pressed Steel)
Central Alloy Steel Corp., Massillon, O.

KEYS (Finished Machine)
Morton Mfg. Co., Muskegon, Mich.

KEYWAY CUTTERS (Stationary & Portable)
Morton Mfg. Co., Muskegon, Mich.

KNIVES AND SHEAR BLADES —See SHEAR BLADES AND KNIVES

LADLES
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.

LAKE PASENGER AND FREIGHT
Cleveland & Buffalo Transit Co., The, E. 9th St. Pier, Cleveland, O.

LATH (Expanded Metal)
Central Alloy Steel Corp., Massillon, O.

LATHES
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

LATHES (Roll Turning)
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

LEAD BURNING
Dietzel Lead Burning Co., Keystone Bldg., Pittsburgh, Pa.

LEAD BURNING APPARATUS (Oxy-Acetylene)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

LEAD POTS
Farrell-Cheek Steel Foundry Co., Sandusky, O.
Strong, Carlisle & Hammond Co., The, 1392 W. 3rd St., Cleveland, O.

LEATHER BELTING—See BELTING (Leather)

LEVELING MACHINES
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

LIFTING MAGNETS—See MAGNETS (Lifting)

LININGS (Lead for Pickling Tanks)
Dietzel Lead Burning Co., Keystone Bldg., Pittsburgh, Pa.

LOCK WASHER MACHINERY
Sleeper & Hartley, Inc., Worcester, Mass.

LOCOMOTIVE CRANES — See CRANES (Locomotive)

LOCOMOTIVES (Electric)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.
General Electric Co., Schenectady, N. Y.
Whitcomb, Geo. D., Co., Rochelle, Ill.

LOCOMOTIVES (Gasoline)
Whitcomb, Geo. D., Co., Rochelle, Ill.

LOCOMOTIVES (Industrial)
Poliakoff, R., 709 Sixth Ave., New York City.
Whitcomb, Geo. D., Co., Rochelle, Ill.

LOCOMOTIVES (Steam)
Poliakoff, R., 709 Sixth Ave., New York City.

LOCOMOTIVES (Storage Battery)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.

LUBRICATORS (Forced Feed)
Hills McCanna Co., 2025 Elston Ave., Chicago, Ill.

LUMBER (Creosoted or Zinc Treated)
Century Wood Preserving Co., 1053 Century Bldg., Pittsburgh, Pa.

MACHINE KEYS—See KEYS AND COTTERS (Machine)

MACHINE WORK
Air Tight Steel Tank Co., Mansion and Gloster Sts., Pittsburgh, Pa.
Hanna Engineering Works, 1766 Elston Ave., Chicago, Ill.
Johnson, Carlyle, Machine Co., Manchester, Conn.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.
Wellman-Seaver-Morgan Co., 7025 Central Ave., Cleveland, O.

MACHINERY (Used)
Fitzsimmons & Cole Machinery Co., 1208 House Bldg., Pittsburgh, Pa.
Miles Machinery Co., Saginaw, Mich.
Morey & Co., Inc., 410 Broome St., New York City.
Potts, Henry, & Co., 1608 Bankers Trust Bldg., Philadelphia, Pa.
Wickes Machinery Co., Claremont and Mallory Aves., Jersey City, N. J.

MAGNETIC SEPARATORS — See SEPARATORS (Magnetic)

MAGNETS (Lifting)
Cutler-Hammer Mfg. Co., The, Milwaukee, Wis.
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland, O.
Ohio Electric & Controller Co., 5900 Maurice Ave., Cleveland, O.

MALLETS (Rawhide)
Chicago Rawhide Mfg. Co., The, 1305 Elston Ave., Chicago, Ill.

MAGNESITE (Dead Burned)
General Refractories Co., 117 S. 16th St., Philadelphia, Pa.

MANGANESE METALS
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.

MANGANESE ORE
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Samuel, Frank, & Co., Harrison Bldg., Pittsburgh, Pa.

MANIFOLDS (Oxygen)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

MATERIAL HANDLING MACHINERY
Browning Crane Co., E. 162nd and Waterloo Rd., Cleveland, O.
Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O.

MERCHANT MILL EQUIPMENT
Morgan Construction Co., Worcester, Mass.
Treadwell Engineering Co., Easton, Pa.

METAL (Perforated)—See PERFORATED METAL

METAL CLEANERS
American Chemical Paint Co., Ambler, Pa.
Cowles Detergent Co., The, 2010 E. 102nd St., Cleveland, O.
Ford, The J. B., Co., Wyandotte, Mich.

METAL DRAWING EQUIPMENT
Marquette Tool & Mfg. Co., 1908 N. Kilbourne Ave., Chicago, Ill.

METAL SPECIALTIES AND PARTS
Erdle Perforating Co., 171 York St., Rochester, N. Y.
Mundt, Chas., & Sons, Johnston & Fairmount Aves., Jersey City, N. J.

METALS (Nonferrous)
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

METAL STAMPINGS — See STAMPINGS

METAL WORKING MACHINES—See SHEET METAL WORKING MACHINERY

METERS (Gas and Air)
Connersville Blower Co., The, Connersville, Ind.
Cutler-Hammer Mfg. Co., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.
Roots, P. H. & F. M., Co., The, Connersville, Ind.

MILL, MINE & FACTORY SUPPLIES
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

MILLS (Blooming, Universal, Plate, Sheet, Etc.)
National Roll & Foundry Co., Avonmore, Pa.
Treadwell Engineering Co., Easton, Pa.

MINING MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

MIXERS (Sand)—See SAND MIXERS, CUTTERS AND SIFTERS

MIXING, KNEADING, TEMPERING AND PUGGING MACHINERY
National Engineering Co., 549 W. Washington Blvd., Chicago, Ill.

MOLDING MACHINES
American Foundry Equipment Co., 407 Byrkit Ave., Mishawaka, Ind.
Herman Pneumatic Machine Co., 806 Union Bank Bldg., Pittsburgh, Pa.

MOLDING MACHINES (Tractor Type Sand Throwing)
Beardsley & Piper Co., 2541 N. Keeler Ave., Chicago, Ill.

MOLDS (Ingot) — See INGOT MOLDS

MOLYBDENUM
Molybdenum Corp. of America, Empire Bldg., Pittsburgh, Pa.

MONEL METAL
International Nickel Co., 67 Wall St., New York City.
Williams & Co., Inc., 915-937 Pennsylvania Ave., Pittsburgh, Pa.

MONORAIL SYSTEMS
Cleveland Electric Tramrail, Division of the Cleveland Crane & Engineering Co., Wickliffe, O.
Milwaukee Electric Crane & Mfg. Co., Milwaukee, Wis.

MOTORS (Electric)
Century Electric Co., 1806 Pine Ave., St. Louis, Mo.
General Electric Co., Schenectady, N. Y.
Lincoln Electric Co., The, Coit Rd. and Kirby Ave., Cleveland, O.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.

MOTOR TRUCKS
Graham Bros. Division of Dodge Bros., Inc., Lynch Rd., Detroit, Mich.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

If it's a SHUSTER Wire Cutter and Straightener—its *RIGHT*

This is why they are to be found in practically all the large wire manufacturing plants and in hundreds of wire using industries.

Shuster Wire Straightening and Cutting Machines are the result of 60 years development. Every effort has, and is, constantly being made to improve these machines so that today we can supply you with a machine that is unrivalled for its accuracy, its efficiency and its low cost of operation.

They make the wire perfectly straight and cut accurate lengths.

THE F. B. SHUSTER COMPANY **Established 1866** **NEW HAVEN, CONN.**

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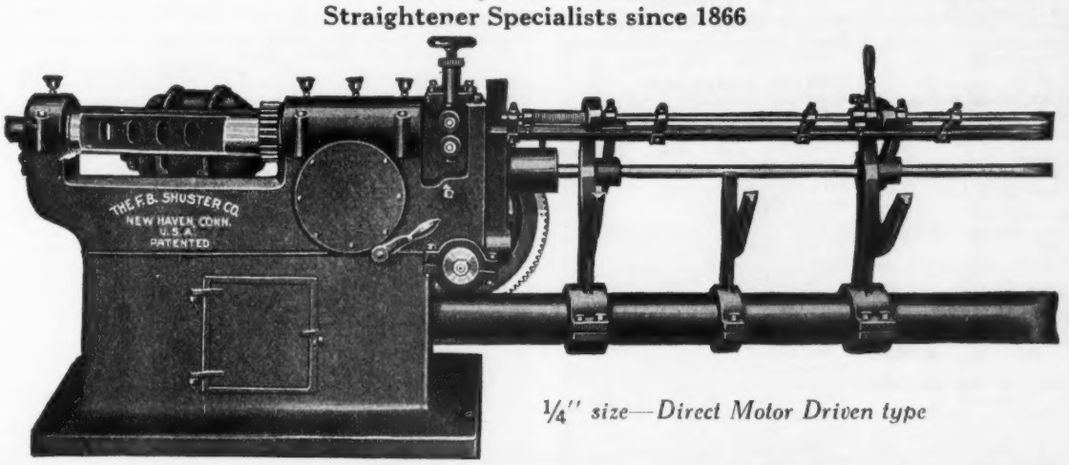
Straightener Specialists since 1866



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TREADWELL

Better Grade Machinery

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Hot Strip Mills
Hoisting Machinery
Special Machinery
Steel and Iron Castings

Treadwell Engineering Company, **Easton, Pa.**

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Worcester, Mass.

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where it is essential to have
Economy-Speed-Reliability
HAND—BELT—ELECTRIC
Ranges ¼-2 in. up to 8-16 in.

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316 Garden St., Bridgeport, Conn.

MORGAN CONSTRUCTION COMPANY

Rolling Mills — Producer Gas Machines
Wire Mills — Reversing Valves

(See first issue each month for SPECIAL ANNOUNCEMENT)

WORCESTER **MASS., U. S. A.**

MUCK BAR
Bethlehem Steel Co., Bethlehem, Pa.
Samuel, Frank, & Co., Harrison Bldg., Philadelphia, Pa.

NAILS
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Bethlehem Steel Co., Bethlehem, Pa.
Pittsburgh Steel Co., P. O. Box 72, Pittsburgh, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

NAILS (Coated and Galvanized)
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Youngstown Sheet & Tube Co., The, Youngstown, O.

NICKEL
American Mond Nickel Corp., Century Bldg., Pittsburgh, Pa.
International Nickel Co., 67 Wall St., New York City.
United States Nickel Co., New Brunswick, N. J.
Williams & Co., Inc., 915-937 Pennsylvania Ave., Pittsburgh, Pa.

NICKEL STEEL (Cold Drawn)
Bethlehem Steel Co., Bethlehem, Pa.

NITROGEN (Gas)
Linde Air Products Co., 30 E. 42nd St., New York City

NUT LOCKS
Mansfield Lock Washer Co., The, Mansfield, O.

NUTS
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Clark Bros. Bolt Co., Milldale, Conn.
Lake Erie Bolt & Nut Co., 915 E. 63rd St., Cleveland, O.
Neely Nut & Bolt Co., 2101 Wharf St., Pittsburgh, Pa.
Oliver Iron & Steel Corp., So. 10th and Muriel Sts., Pittsburgh, Pa.
Republic Iron & Steel Co. Youngstown, O.
Rhode Island Tool Co., Providence, R. I.
Rockford Bolt Co., 220 Mill St., Rockford, Ill.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

OIL (Fuel)—See FUEL OIL

OIL BURNING EQUIPMENT
Best, W. N., Corp., Sixth Ave. and 31st St., New York City.

OIL CUPS
Gits Bros. Mfg. Co., 1940 S. Kilbourne Ave., Chicago, Ill.

OIL PANS
Transue & Williams Steel Forging Corp., Alliance, Ohio.

OPEN-HEARTH FURNACES—See FURNACES (Open Hearth)

ORES—CHROME (Lump or Ground)
General Refractories Co., 117 S. 16th St., Philadelphia, Pa.

OVENS (Coke By-Product Recovery)
Koppers Construction Co., The, Pittsburgh, Pa.

OXY-ACETYLENE WELDING AND CUTTING—See WELDING AND CUTTING APPARATUS AND SUPPLIES (Oxy-Acetylene Process)

OXYGEN IN CYLINDERS
Air Reduction Sales Co., 342 Madison Ave., New York City.
Linde Air Products Co., 30 E. 42nd St., New York City.

PACKING (Leather)
Chicago Rawhide Mfg. Co., 1305 Elston Ave., Chicago, Ill.

PACKINGS
Jenkins Brothers, 80 White St., New York City.

PAINTING CONTRACTORS
Verios, Christ, Company, P. O. Box 972, Pittsburgh, Pa.

PAINT SPRAY BOOTHS
Mellish-Hayward Co., 221 W. Austin Ave., Chicago, Ill.

PAINT SPRAYS
Mellish-Hayward Co., 221 W. Austin Ave., Chicago, Ill.

PAINTING EQUIPMENT
Mellish-Hayward Co., 221 W. Austin Ave., Chicago, Ill.

PERFORATED METAL
Chicago Perforating Co., 2445 W. 24th Place, Chicago, Ill.
Erdle Perforating Co., 171 York St., Rochester, N. Y.
Harrington & King Perforating Co., The, 5634 Fillmore St., Chicago, Ill.
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.
Mundt, Chas., & Sons, Johnston & Fairmount Ave., Jersey City, N. J.
Reliable Perforating Co., 1925 N. Paulina St., Chicago, Ill.

PERMANENT MOLDING MACHINES—See MOLDING MACHINES (Permanent)

PICKLE ROOM SUPPLIES
Ferro Enamel Supply Co., The, Keith Bldg., Cleveland, O.

PICKING COMPOUND
American Chemical Paint Co., Ambler, Pa.
Hearne, William W., Inc., Real Estate Trust Bldg., Philadelphia, Pa.

PICKING MACHINES
Mesta Machine Co., Homestead, Pa.

PICKS, MATTOCKS, ETC.
Oliver Iron & Steel Corp., So. 10th and Muriel Sts., Pittsburgh, Pa.

PIG IRON
Bethlehem Steel Co., Bethlehem, Pa.
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.
Donner Steel Co. Inc., P. O. Box 1000, Buffalo, N. Y.
Eaton, Rhodes & Co., First National Bank Bldg., Cincinnati, O.
Globe Iron Co., Jackson, O.
Hanna, The M. A., Co., Leader Bldg., Cleveland, O.
Illinois Steel Co., 208 So. La Salle St., Chicago, Ill.
Mohr, J. J., & Son, Bullitt Bldg., Philadelphia, Pa.
Park & Williams, Inc., Real Estate Trust Bldg., Philadelphia, Pa.
Pickands, Mather & Co., Union Trust Bldg., Cleveland, O.
Pilling & Co., Inc., 1500 Chestnut St., Philadelphia, Pa.
Rogers Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.
Snyder, W. P., & Co., Oliver Bldg., Pittsburgh, Pa.
Stewart Furnace Co., 1854 Union Trust Bldg., Cleveland, O.
Tutein, E. Arthur, Inc., 100 Milk St., Boston, Mass.
Valley Mould & Iron Corp., Sharpsville, Pa.
Wood, Alan Iron & Steel Co., Widener Bldg., Philadelphia, Pa.

PILE DRIVERS
Orton Crane & Shovel Co., 608 S. Dearborn St., Chicago, Ill.

PILING (Steel Sheet)
Bethlehem Steel Co., Bethlehem, Pa.
Wemlinger, Inc., 149 Broadway, New York City.

PINIONS—See GEARS AND GEAR CUTTING

PIPE (Brass, Bronze and Copper)
American Brass Co., 25 Broadway, New York City.

PIPE (Cast Iron)
United States Cast Iron Pipe & Foundry Co., Burlington, N. J.

PIPE (Riveted Steel)
Abendroth & Root Mfg. Co., Woolworth Bldg., New York City.

PIPE (Spiral Riveted)
Abendroth & Root Mfg. Co., Woolworth Bldg., New York City.

PIPE (Steel)
Allegheny Steel Co., Brackenridge, Pa.
Central Tube Co., First National Bank Bldg., Pittsburgh, Pa.
Crane Co., 836 S. Michigan Blvd., Chicago, Ill.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Michigan Steel Tube Products Co., Holbrook & Buffalo Sts., Detroit, Mich.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Republic Iron & Steel Co., Youngstown, O.
Youngstown Sheet & Tube Co., Youngstown, O.

PIPE (Wrought Steel)
Central Tube Co., First National Bank Bldg., Pittsburgh, Pa.
National Tube Co., Frick Bldg., Pittsburgh, Pa.

PIPE AND FITTINGS (Acid Resisting)
Duriron Co., Inc., The, Dayton, O.

PIPE BENDING MACHINES
American Pipe Bending Machine Co., 93 Pearl St., Boston, Mass.

PIPE BENDS
Crane Co., 836 S. Michigan Blvd., Chicago, Ill.

PIPE CUTTING AND THREADING MACHINERY
Aetna-Standard Engineering Co., The, Youngstown, O.
Curtis & Curtis Co., 316 Garden St., Bridgeport, Conn.
Jarecki Mfg. Co., Erie, Pa.
Landis Machine Co., Waynesboro, Pa.

PIPE FITTINGS
Crane Co., 836 S. Michigan Blvd., Chicago, Ill.
Illinois Malleable Iron Co., 1801 Diversey Blvd., Chicago, Ill.
Power Piping Co., 829 Beaver Ave., Pittsburgh, Pa.

PIPE MILL MACHINERY
Mackintosh-Hemphill Co., 12th & Etna Sts., Pittsburgh, Pa.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

PIPE STRAIGHTENING MACHINES
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

PIPE WRENCHES—See WRENCHES (Pipe)

PIPING CONTRACTORS
Floersheim, B., & Co., 622 Farmers Bank Bldg., Pittsburgh, Pa.
Power Piping Co., 829 Beaver Ave., Pittsburgh, Pa.

PLANERS AND SHAPERS
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

PLANES (Traveling Head)
Morton Mfg. Co., Muskegon, Mich.

PLATE CASTORS
Hyatt Roller Bearing Co., Newark, N. J.

PLATES
Migret, Rene, 7 Boulevard Defontaine, Charleroi, Belgium

PLATES (Iron and Steel)
Bethlehem Steel Co., Bethlehem, Pa.

PLATES (Rolled Steel—Floor)
American Pressed Steel Co., Commercial Trust Bldg., Philadelphia, Pa.
Central Iron & Steel Co., Harrisburg, Pa.
Wood, Alan, Iron & Steel Co., Widener Bldg., Philadelphia, Pa.

PLATES (Sheared and Universal)
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Central Iron & Steel Co., Harrisburg, Pa.
Granite City Steel Works, The, Granite City, Ill.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Illinois Steel Warehouse Co., 1219 Wabansia Ave., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
National Enameling & Stamping Co., Granite City, Ill.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Wood, Alan, Iron & Steel Co., Widener Bldg., Philadelphia, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

PLATES (Terne and Tin)—See TIN PLATE

PLUMBING EQUIPMENT
Crane Co., 836 S. Michigan Blvd., Chicago, Ill.

PNEUMATIC TOOLS—See TOOLS—(Pneumatic)

POLES (Tubular Steel)
National Tube Co., Frick Bldg., Pittsburgh, Pa.

PORCELAIN ENAMELING EQUIPMENT
Ferro Enamel Supply Co., The, Keith Bldg., Cleveland, O.

PORTABLE LOADERS (Bucket or Belt)
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.

POTS (Salt, Lead, Cyanide)
Case Hardening Service Co., 2280 Scranton Rd., Cleveland, Ohio.

POTS (Tin)
Pittsburgh Annealing Box Co., 801 Beaver Ave. N.S., Pittsburgh, Pa.

POWDERED COAL EQUIPMENT
Combustion Engineering Corp., 200 Madison Ave., New York City.
Fuller Lehigh Co., Fullerton, Pa.

POWER TRANSMISSION
Jones, W. A., Foundry & Machine Co., 4437 W. Roosevelt Ave., Chicago, Ill.

PREHEATERS
Combustion Engineering Corp., 200 Madison Ave., New York City.

PREHEATING APPARATUS
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

PRESSED METAL—See STAMPINGS

PRESSED STEEL PARTS—See STAMPINGS

PRESSES
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Cleveland Punch & Shear Works, 3917 St. Clair Ave., Cleveland, O.
Erie Foundry Co., Erie, Pa.
Mesta Machine Co., Homestead, Pa.
Niagara Machine & Tool Works, 685 Northland Ave., Buffalo, N. Y.
Peck, Stow & Wilcox Co., Southington, Conn.
Toledo Machine & Tool Co., Toledo, O.
V & O Press Co., Hudson, N. Y.

PRESSES (Automatic, Ridge, Roll and Gutter)
Streine Tool & Mfg. Co., The, New Bremen, O.

PRESSES (Die Cutting)
Logemann Bros. Co., 3126 Burleigh St., Milwaukee, Wis.

PRESSES (Forging)
Morgan Engineering Co., Alliance, O.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

PRESSES (Hydraulic)
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Chambersburg Engineering Co., Chambersburg, Pa.
Farrel Foundry & Machine Co., Ansonia, Conn.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Morgan Engineering Co., Alliance, O.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

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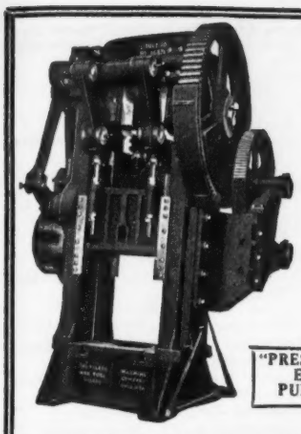

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Where simplicity of design, efficiency and economy of performance and low upkeep are prime requisites, these presses are installed in large numbers.

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YOUNGSTOWN · OHIO

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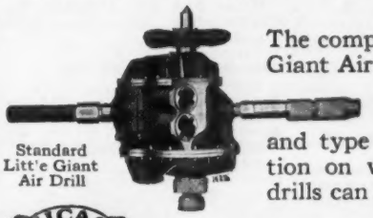
Little Giant Air Drills



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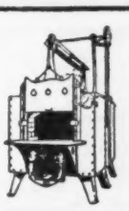

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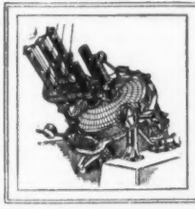
CLEVELAND, OHIO



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Streine Tool & Mfg. Co., The, New Bremen, O.

PRESSES (Scrap Bundling and Baling)
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.

PRESSES (Shaft and Pipe Straightening—Hydraulic
Logemann Bros. Co., 3126 Burleigh St., Milwaukee, Wis.

PRESSES (Straightening)
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

PRODUCER GAS SYSTEMS—See GAS PRODUCTS PLANTS

PUMPS
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Connersville Blower Co., The, Connersville, Ind.,
Deming Co., The, Salem, O.

PUMPS (Acid Resisting)
Duriron Co., Inc., The, Dayton, Ohio.

PUMPS (Air Lift)
Sullivan Machinery Co., 78 E. Adams St., Chicago, Ill.

PUMPS (Boiler Feed)
Ingersoll-Rand Co., (Cameron). 11 Broadway, New York City.

PUMPS (Centrifugal)
Ingersoll-Rand Co. (Cameron). 11 Broadway, New York City.

PUMPS (Force)
Deming Co., The, Salem, O.

PUMPS (Hand & Power)
Myers, F. E., & Brother Co., The, Ashland, O.

PUMPS (Hydraulic)
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

PUMPS (Industrial)
Deming Co., The, Salem, O.

PUMPS (Power)
Deming Co., The, Salem, O.

PUMPS (Spray)
Deming Co., The, Salem, O.

PUMPS (Steam)
Ingersoll-Rand Co. (Cameron), 11 Broadway, New York City.

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Cleveland Punch & Shear Works Co., The, 3917 St. Clair Ave., Cleveland, O.
Thomas Spacing Machine Co., Fulton Bldg., Pittsburgh, Pa.

PUNCHES AND DIES
Cleveland Punch & Shear Works Co., The, 3917 St. Clair Ave., Cleveland, O.
Marchant, George F., Co., 1434 So. Rockwell St., Chicago, Ill.

PUNCHES & SHEARS (Hand)
Whitney Metal Tool Co., Rockford, Ill.

PUNCHING AND SHEARING MACHINERY
Beatty Machine & Mfg. Co., Hammond, Ind.
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Chambersburg Engineering Co., Chambersburg, Pa.
Cleveland Punch & Shear Works Co., 3917 St. Clair Ave., Cleveland, O.
Long & Allstatter Co., Hamilton, O.
Niagara Machine & Tool Works, 685 Northland Ave., Buffalo, N. Y.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

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Taylor Instrument Co., 95 Ames St., Rochester, N. Y.

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Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Frank, M. K., Union Trust Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birmingham, Ala.

RAILS (Girder)
Bethlehem Steel Co., Bethlehem, Pa.

RAILS (Light Steel)
Sweet's Steel Co., Williamsport, Pa.

REDUCERS (Speed—Worm and Spur) See SPEED REDUCERS (Worm and Spur)

REFRACTORIES
Ashland Fire Brick Co., Ashland, Ky.
Botfield Refractories Co., Swanson and Clymer Sts., Philadelphia, Pa.
Brighton Fire Brick Co., Block House Run, New Brighton, Pa.
Carborundum Co., The, Buffalo and 18th Sts., Niagara Falls, N. Y.
Crescent Refractories Co., Curwensville, Pa.
Dover Fire Brick Co., 1012 Nat'l City Bank Bldg., Cleveland, O.,
Eureka Fire Brick Works, First National Bank Bldg., Pittsburgh, Pa.
General Refractories Co., 117 S. 16th St., Philadelphia, Pa.
Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittsburgh, Pa.
Hydraulic-Press Brick Co., Central National Bank Bldg., St. Louis, Mo.
Illinois Clay Products Co., 214 Barber Bldg., Joliet, Ill.
Kier Fire Brick Co., Oliver Bldg., Pittsburgh, Pa.
Laclede-Christy Clay Products Co., St. Louis, Mo.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Norton Co., Worcester, Mass.
Queen's Run Refractories Co., Inc., Lock Haven, Pa.
Stowe-Fuller Refractories Co., The, 1650 Union Trust Bldg., Cleveland, O.
Taylor, Chas., Sons Co., The, Burns St., Cincinnati, Ohio.
Union Mining Co., 1113 Fidelity Bldg., Baltimore, Md.
Walsh Fire Clay Products Co., 4070 N. Main St., St. Louis, Mo.

REGISTERS (Heating and Ventilating)
Auer Register Co., The, Payne Ave. and E. 37th St., Cleveland, O.

REGULATORS (Compressed Gas)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

REGULATORS (Pressure)
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland, O.

RHEOSTATS
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland, O.

RINGS (Welded Iron & Steel)
Akron-Selle Co., Akron, O.

RIVET HEATERS (Electric)
General Electric Co., Schenectady, N. Y.

RIVET SETS
Cleveland Punch & Shear Works Co., The, 3917 St. Clair Ave., Cleveland, O.
Hunter Saw & Machine Co., 5656 Butler St., Pittsburgh, Pa.
Marchant, George F., Co., 1434 S. Rockwell St., Chicago, Ill.

RIVETERS (Hydraulic)
Chambersburg Engineering Co., Chambersburg, Pa.

RIVETERS (Pneumatic)
Cleveland Pneumatic Tool Co., 3734 E. 78th St., Cleveland, O.
Hanna Engineering Works, 1766 Elston Ave., Chicago, Ill.

RIVETING MACHINERY
Hanna Engineering Works, 1766 Elston Ave., Chicago, Ill.
Shuster, The F. B., Co., New Haven, Conn.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

RIVETS
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Clark Bros. Bolt Co., Milldale, Conn.
Illinois Steel Warehouse Co., 1318 Wabansia Ave., Chicago, Ill.
Interstate Iron & Steel Co., 104 S. Michigan Ave., Chicago. Ill.
Neely Nut & Bolt Co., 2101 Wharton St., Pittsburgh, Pa.
Progressive Mfg. Co., Torrington, Conn.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

ROD MILLS
Morgan Construction Co., Worcester, Mass.
Treadwell Engineering Co., Easton, Pa.

RODS (Acid Resisting)
Alcumite Corp., The, Dayton, O.

RODS (Brass Bronze, Copper and Nickel Silver)
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RODS (Drill)
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Kidd Drawn Steel Co., Aliquippa, Pa.
Pittsburgh Tool Steel Wire Co., Monaca, Pa.
Wheelock, Lovejoy & Co., Inc., 128 Sidney St., Cambridge, Mass.

RODS (Iron and Steel)
Bethlehem Steel Co., Bethlehem, Pa.

RODS (Welding)—See WELDING RODS

ROLL GRINDERS
Farrel Foundry & Machine Co., Ansonia, Conn.

ROLLING DOORS AND SHUTTERS
Kinnear Manufacturing Co., 818-868 Field Ave., Columbus, O.
Moeschl-Edwards Const. Co., The, 120 W. 9th St., Covington, Ky.

ROLLING MBACHINERY (Cold Rolling)
Lewis Foundry & Machine Co., Pittsburgh, Pa.

ROLLING MACHINERY (Corrugating)
Streine Tool & Mfg. Co., The, New Bremen, O.

ROLLING MACHINERY (Sheet Leveller)
Streine Tool & Mfg. Co., The, New Bremen, O.

ROLLING MACHINERY (Sheet Metal)
Streine Tool & Mfg. Co., The, New Bremen, O.

ROLLING MACHINERY (Sheet Oiling)
Streine Tool & Mfg. Co., The, New Bremen, O.

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Hyatt Roller Bearing Co., Newark, N. J.
Norma-Hoffmann Bearings Corp., Stamford, Conn.

ROLLING MILL EQUIPMENT
Aetna-Standard Engineering Co., The, Youngstown, O.
Alliance Machine Co., The, Alliance, O.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Hyde Park Foundry & Machine Co., Hyde Park, Pa.
Lewis Foundry & Machine Co., Pittsburgh, Pa.
Mackintosh-Hemphill Co., Pittsburgh, Pa.
Mesta Machine Co., Homestead, Pa.
Morgan Construction Co., Worcester, Mass.
Morgan Engineering Co., Alliance, O.
National Roll & Foundry Co., Avonmore, Pa.
Stroh Steel Hardening Process Co., Westinghouse Bldg., Pittsburgh, Pa.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.
Treadwell Engineering Co., Easton, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O.
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Aetna-Standard Engineering Co., Youngstown, Ohio.

ROLLS Sand & Chilled)
Lewis Foundry & Machine Co., Pittsburgh, Pa.

ROLLS (Steel)
Aetna-Standard Engineering Co., The, Youngstown, O.
American Adamite Co., The, 12th & Etna Sts., Pittsburgh, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Hyde Park Foundry & Machine Co., Hyde Park, Pa.
Lewis Foundry & Machine Co., Pittsburgh, Pa.
Mackintosh-Hemphill Co., 12th & Etna Sts., Pittsburgh, Pa.
Mesta Machine Co., Homestead, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
National Roll & Foundry Co., Avonmore, Pa.
Pittsburgh Rolls Corp., 41st St. and A. V. Ry., Pittsburgh, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Wheeling Mold & Foundry Co., Wheeling, W. Va.

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Dart, E. M., Mfg. Co., Providence, R. I.

ROOFING (Special Copper Bearing Steel)
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Newport Rolling Mill Co., Newport, Ky.

ROOFING AND SIDING (Iron and Steel)
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SAND
Portage Silica Co., The, 602 Stambaugh Bldg., Youngstown, O.

SAND (Molding)
Rogers Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.

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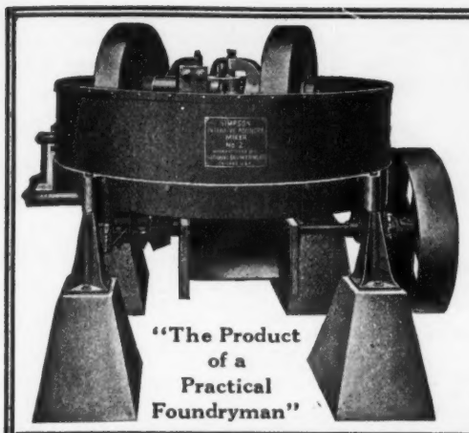

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United States Silica Co., 122 South Michigan Ave., Chicago, Ill.

SAND (Silica)
United States Silica Co., 122 So. Michigan Ave., Chicago, Ill.

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American Foundry Equipment Co., 407 Byrkit Ave., Mishawaka, Ind.
Pangborn Corp., P. O. Box 858, Hagerstown, Md.
Sly, W. W., Mfg. Co., 4700 Train Ave., Cleveland, O.

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Beardsley & Piper Co., The, 2541 No. Keeler Ave., Chicago, Ill.

SAND CONVEYING AND HANDLING MACHINERY
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Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.

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American Foundry Equipment Co., 407 Byrkit Ave., Mishawaka, Ind.
Beardsley & Piper Co., 2541 N. Keeler Ave., Chicago, Ill.
Blystone Mfg. Co., Ironton St., Cambridge Springs, Pa.
National Engineering Co., 549 W. Washington Blvd., Chicago, Ill.

SAND MIXERS (Core and Facing Sand)
National Engineering Co., 549 W. Washington Blvd., Chicago, Ill.

SAND SLINGERS
Beardsley & Piper Co., 2541 N. Keeler Ave., Chicago, Ill.

SAW SHARPENING MACHINES
Hunter Saw & Machine Co., 5656 Butler St., Pittsburgh, Pa.

SAWS (Cold and Hot Metal)
Hunter Saw & Machine Co., 5656 Butler St., Pittsburgh, Pa.
Huther Bros. Saw Mfg. Co., 1190 University Ave., Rochester, N. Y.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

SAWS (High Speed Friction)
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

SAWS (Portable Lumber)
Onan, D. W., & Sons, 19 Royalston Ave., Minneapolis, Minn.

SCALES, AUTOMATIC DIAL (Heavy Duty, Bench, Overhead Track, Tank, Hanging, Packing, Counting, Special Purposes)
Buffalo Scale Co., 1200 Niagara St., Buffalo, N. Y.
Fairbanks Co., Broome and Lafayette Sts., New York City.
Fairbanks, Morse & Co., Inc., 900 So. Wabash Ave., Chicago, Ill.

SCALES (Dial)
Buffalo Scale Co., 1200 Niagara St., Buffalo, N. Y.
Fairbanks Co., Broome and Lafayette Sts., New York City.
Fairbanks, Morse & Co., 900 So. Wabash Ave., Chicago, Ill.

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Buffalo Scale Co., 1200 Niagara St., Buffalo, N. Y.
Fairbanks Co., Broome and Lafayette Sts., New York City.
Fairbanks, Morse & Co., 900 So. Wabash Ave., Chicago, Ill.

SCLEROSCOPE, HARDNESS MEASURING
Shore Instrument & Mfg. Co., Van Wyck Ave. and Carll St., Jamaica, N. Y.

SCRAP
Samuel, Frank, & Co., Harrison Bldg., Philadelphia, Pa.

SCRAP BALING PRESSES
Logemann Bros. Co., 3126 Burleigh St., Milwaukee, Wis.

SCRAP BUNDLERS (Wire)
Vaughn Machinery Co., Cuyahoga Falls, Ohio.

SCREENS
Chicago Perforating Co., 2445 W. 24th Place, Chicago, Ill.
Harrington & King Perforating Co., The, 5634 Fillmore St., Chicago, Ill.
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.

SCREENS AND SIEVES
Erdle Perforating Co., 171 York St., Rochester, N. Y.
Mundt, Chas., & Sons, Johnston and Fairmont Aves., Jersey City, N. J.

SCREW MACHINES (Automatic, Single & Multiple Spindle)
National Acme Co., E. 131st St. & Coit Rd., Cleveland, Ohio.

SCREW MACHINE PRODUCTS
Fischer Special Mfg. Co., The, 446 Morgan St., Cincinnati, O.
National Acme Co., E. 131st & Coit Rd., Cleveland, O.
Wellman Products Co., The, 1448 E. 49th St., Cleveland, O.

SCREW STOCK (Cold Drawn)
Union Drawn Steel Co., Beaver Falls, Pa.

SCREW STOCK (Free Cutting)
Union Drawn Steel Co., Beaver Falls, Pa.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

SCREWS
Clark Bros. Bolt Co., Milldale, Conn.
Parker-Kalon Corp., 358 W. 13th St., New York City.
Progressive Mfg. Co., Torrington, Conn.

SCREWS (Cap and Heat Treated)
Rhode Island Tool Co., Providence, R. I.

SCREWS (Cap and Set)
Allen Mfg. Co., Hartford, Conn.
Clark Bros. Bolt Co., Milldale, Conn.

SCREWS (Drive—Hardened Metallic)
Parker-Kalon Corp., 358 W. 13th St., New York City.

SCREWS (Lag)
Kirk-Latty Co., 1917 W. 85th St., Cleveland, O.
Lamson & Sessions Co., The, 2188 Scranton Rd., Cleveland, O.

SCREWS (Sheet Metal Self-Tapping)
Parker-Kalon Corp., 358 W. 13th St., New York City.

SEAMLESS STEEL TUBING—See TUBES (Cold Drawn Seamless Steel)

SEATS (Copper Valve)
Lawrenceville Bronze Co., 518 Bessemer Bldg., Pittsburgh, Pa.

SEPARATORS (Magnetic)
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland, O.
Ohio Electric & Controller Co., 5900 Maurice Ave., Cleveland, O.

SET SCREWS
Clark Bros. Bolt Co., Milldale, Conn.

SHAFT AND PIPE STRAIGHTENERS (Hydraulic)
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.

SHAFT HANGERS
Hyatt Roller Bearing Co., Newark, N. J.

SHAFTING
Bethlehem Steel Co., Bethlehem, Pa.
Bliss & Laughlin, Inc., Harvey, Ill.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Vanadium Corp. of America, 120 Broadway, New York City
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

SHAFTING (Cold Drawn)
Union Drawn Steel Co., Beaver Falls, Pa.

SHAFTING (Cold Drawn and Turned)
Bethlehem Steel Co., Bethlehem, Pa.

SHAFTING (Turned and Polished)
Union Drawn Steel Co., Beaver Falls, Pa.

SHAPERS—See PLANERS AND SHAPERS

SHAPERS (Heavy Duty Draw-Out)
Morton Mfg. Co., Muskegon, Mich.

SHAPES (Steel) — See STEEL (Structural)

SHEAR BLADES AND KNIVES
Heppenstall Forge & Knife Co., 47th and Hatfield Sts., Pittsburgh, Pa.
Marchant, George F., Co., 1434 S. Rockwell St., Chicago, Ill.

SHEARING MACHINERY (Continuous Automatic Hot Mill)
Streine Tool & Mfg. Co., The, New Bremen, O.

SHEARING MACHINERY (Rotary Gang Slitting)
Streine Tool & Mfg. Co., The, New Bremen, O.

SHEARING MACHINERY (Squaring)
Streine Tool & Mfg. Co., The, New Bremen, O.

SHEARS
Beatty Machine & Mfg. Co., Hammond, Ind.
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Cleveland Punch & Shear Works Co., The, 3917 St. Clair Ave., Cleveland, O.
Farrel Foundry & Machine Co., Ansonia, Conn.
Morgan Engineering Co., Alliance, O.
National Roll & Foundry Co., Avonmore, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Toledo Machine & Tool Co., Toledo, O.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

SHEARS (Squaring)
Niagara Machine & Tool Works, 685 Northland Ave., Buffalo, N. Y.

SHEET BARS
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Mansfield Sheet & Tin Plate Co., The, Mansfield, O.

SHEET METAL PRODUCTS—See STAMPINGS

SHEET METAL SCREWS (Hardened Self-Tapping)
Parker-Kalon Corp., 358 W. 13th St., New York City.

SHEET METAL STRAIGHTENERS
Shuster, The F. B., Co., New Haven, Conn.

SHEET METAL WORK
Crosby Co., The, 183 Pratt St., Buffalo, N. Y.

SHEET METAL WORKING MACHINERY
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Cleveland Punch & Shear Works Co., The, 3917 St. Clair Ave., Cleveland, O.
Niagara Machine & Tool Works, 685 Northland Ave., Buffalo, N. Y.
Peck, Stow & Wilcox Co., Southington, Conn.
Toledo Machine & Tool Co., Toledo, O.

SHEETS
American Rolling Mill Co., Middletown, O.
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Apollo Steel Co., Apollo, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Central Alloy Steel Corp., Massillon, O.
Columbia Steel Corp., Balfour Bldg., San Francisco, Calif.
Granite City Steel Works, The, Granite City, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Mansfield Sheet & Tin Plate Co., The, Mansfield, O.
Morris, Wheeler & Co., 30th and Locust Sts., Philadelphia, Pa.
National Enameling & Stamping Co., Granite City, Ill.
Newport Rolling Mill Co., Newport, Ky.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Seneca Iron & Steel Co., Buffalo, N. Y.
Sheet Steel Trade Extension Committee, 715 Oliver Bldg., Pittsburgh, Pa.
Superior Sheet Steel Co., Canton, Ohio.
Trumbull Steel Co., The, Warren, O.

SHEETS (Acid Resisting)
Alcumite Corp., The, Dayton, O.

SHEETS (Automobile)
Allegheny Steel Co., Brackenridge, Pa.
American Rolling Mill Co., Middletown, O.
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Central Alloy Steel Corp., Massillon, O.
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.
Mansfield Sheet & Tin Plate Co., The, Mansfield, O.
Newton Steel Co., Youngstown, O.
Seneca Iron & Steel Co., Buffalo, N. Y.

SHEETS (Black)
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Apollo Steel Co., Apollo, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.
Granite City Steel Works, The, Granite City, Ill.
Mansfield Sheet & Tin Plate Co., The, Mansfield, O.
National Enameling & Stamping Co., Granite City, Ill.
Newport Rolling Mill Co., Newport, Ky.
Newton Steel Co., Youngstown, O.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Seneca Iron and Steel Co., Buffalo, N. Y.
Superior Sheet Steel Co. Canton, Ohio
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS (Blue Annealed)
American Rolling Mill Co., Middletown, O.
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Apollo Steel Co., Apollo, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Central Alloy Steel Corp., Massillon, O.
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.
Granite City Steel Works, The, Granite City, Ill.
Mansfield Sheet & Tin Plate Co., The, Mansfield, O.
National Enameling & Stamping Co., Granite City, Ill.
Newport Rolling Mill Co., Newport, Ky.
Newton Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Sharon Steel Hoop Co., Sharon, Pa.
Tennessee Coal, Iron & Railroad Co., 1351 Brown-Marx Bldg., Birmingham, Ala.
Trumbull Steel Co., The, Warren, O.
Wood, Alan, Iron & Steel Co., Widener Bldg., Philadelphia, Pa.

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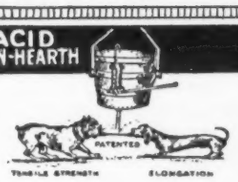

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Newport Rolling Mill Co., Newport, Ky.
Sharon Steel Hoop Co., Sharon, Pa.

SHEETS (Brass, Bronze, Copper and Nickel Silver)
American Brass Co., 25 Broadway, New York City.

SHEETS (Cold Rolled)
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.
Newton Steel Co., Youngstown, O.

SHEETS (Copper Steel)
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Newport Rolling Mill Co., Newport, Ky.
Superior Sheet Steel Co., Canton, Ohio

SHEETS (Corrugated)
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Apollo Steel Co., Apollo, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Weirton Steel Co., Weirton, W. Va.

SHEETS (Deep Drawing and Stamping)
Allegheny Steel Co., Brackenridge, Pa.
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.
Newport Rolling Mill Co., Newport, Ky.
Newton Steel Co., Youngstown, O.

SHEETS (Electrical)
Allegheny Steel Co., Brackenridge, Pa.
American Rolling Mill Co., Middletown, O.
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Central Alloy Steel Corp., Massillon, O.
Mansfield Sheet & Tin Plate Co., The, Mansfield, O.
Newport Rolling Mill Co., Newport, Ky.
Trumbull Steel Co., The, Warren, O.

SHEETS (Enameling)
Newport Rolling Mill Co., Newport, Ky.

SHEETS (Galvanized)
American Rolling Mill Co., Middletown, O.
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Apollo Steel Co., Apollo, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Granite City Steel Works, The, Granite City, Ill.
National Enameling & Stamping Co., Granite City, Ill.
Newport Rolling Mill Co., Newport, Ky.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Superior Sheet Steel Co., Canton, Ohio
Trumbull Steel Co., The, Warren, O.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS (Lead Coated)
Superior Sheet Steel Co., Canton, Ohio

SHEETS (Locomotive Jacket)
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.

SHEETS (Metal Furniture)
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.
Newport Rolling Mill Co., Newport, Ky.

SHEETS (Perforated)
Erdle Perforating Co., 171 York St., Rochester, N. Y.

SHEETS (Pickled)
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.
Newport Rolling Mill Co., Newport, Ky.
Newton Steel Co., Youngstown, O.

SHEETS (Roofing)—See ROOFING AND SIDING

SHEETS (Tin)—See TIN PLATE

SHELVING (Steel)
Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.

SHIPBUILDING SHAPES
Bethlehem Steel Co., Bethlehem, Pa.

SIEVES
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.

SLABS
Andrews Steel Co., Newport, Ky.
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Mansfield Sheet & Tin Plate Co., The, Mansfield, O.

SLABS (Concrete Floor)
American Cement Tile Mfg. Co., Oliver Bldg., Pittsburgh, Pa.

SLEEVES AND NOZZLES
Tempest Brick Co., Ltd., The, House Bldg., Pittsburgh, Pa.

SNAP FLASKS
Sterling Wheelbarrow Co., Milwaukee, Wis.

SOAKING PITS
Chapman-Stein Furnace Co., Mt. Vernon, O.

SPACING TABLES
Thomas Spacing Machine Co., Fulton Bldg., Pittsburgh, Pa.

SPECIAL MACHINERY
Aetna-Standard Engineering Co., The, Youngstown, O.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Bethlehem Steel Co., Bethlehem, Pa.
Morgan Engineering Co., Alliance, O.
National Roll & Foundry Co., Avonmore, Pa.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.
Tioga Steel & Iron Co., 52nd and Grays Ave., Philadelphia, Pa.
Treadwell Engineering Co., Easton, Pa.
Wellman-Seaver-Morgan Co., 7025 Central Ave., Cleveland, O.
Wheeling Mold & Foundry Co., Wheeling, W. Va.

SPECIAL SHAPES
Sharon Steel Hoop Co., Sharon, Pa.

SPECIAL SHAPES (Cold Drawn)
Union Drawn Steel Co., Beaver Falls, Pa.

SPEED REDUCERS
Jones, W. A., Foundry & Machine Co., 4437 W. Roosevelt Rd., Chicago, Ill.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.

SPEED REDUCERS (Worm and Spur)
Albaugh-Dover Mfg. Co., 2154 Marshall Blvd., Chicago, Ill.
Philadelphia Gear Works, E. Tioga, Philadelphia, Pa.

SPIEGELEISEN
Leavitt, C. W., & Co., 30 Church St., New York City.
Rogers Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.

SPIKES
Bethlehem Steel Co., Bethlehem, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.

SPINDLES (Lathe, Hollow Bored)
American Hollow Boring Co., 1055 W. 19th St., Erie, Pa.

SPLICE BARS (Plain and Angle)
Sweet's Steel Co., Williamsport, Pa.

SPRING MAKING MACHINERY
Sleeper & Hartley, Inc., Worcester, Mass.

SPRINGS
American Spiral Spring & Mfg. Co., Arsenal Station, Pittsburgh, Pa.
American Spring & Mfg. Co., Elm St., Holly, Mich.
American Steel & Wire Co., 208 So. LaSalle St., Chicago, Ill.
Barnes-Gibson-Raymond, Inc., 6400 Miller Ave., Detroit, Mich.
Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.
Cook Spring Co., Ann Arbor, Mich.
Duer Spring & Mfg. Co., Pittsburgh, Pa.
Hubbard, M. D., Spring Co., Pontiac, Mich.
Peterson Spring Co., The, 1660 Beard Ave., Detroit, Mich.
Raymond Mfg. Co., Centre St., Corry, Pa.
Young, L. A., Industries, Inc., 9200 Russell St., Detroit, Mich.

SPRINGS (Car)
American Spiral Spring & Mfg. Co., Arsenal Station, Pittsburgh, Pa.
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.

SPRINGS (Coil, Flat, Elliptic, Spiral)
American Spiral Spring & Mfg. Co., Arsenal Station, Pittsburgh, Pa.
American Spring & Mfg. Co., Elm St., Holly, Mich.
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Barnes-Gibson-Raymond, Inc., 4200 Miller Ave., Detroit, Mich.
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Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.
Cook Spring Co., Ann Arbor, Mich.
Hubbard, M. D., Spring Co., Pontiac, Mich.
Peterson Spring Co., The, 1660 Beard Ave., Detroit, Mich.
Raymond Mfg. Co., Centre St., Corry, Pa.
Young, L. A., Industries, Inc., 9200 Russell St., Detroit, Mich.

SPRUE CUTTERS
Hanna Engineering Works, 1766 Elston Ave., Chicago, Ill.
Shuster, The B. F., Co., New Haven, Conn.

STACKS (Steel)
American Bridge Co., The, 71 Broadway, New York City.
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.
Sotter Bros., Inc., Pottstown, Pa.

STAMPING EQUIPMENT
Marquette Tool & Mfg. Co., 1908 N. Kilbourne Ave., Chicago, Ill.

STAMPINGS
American Spring & Mfg. Co., Elm St., Holly, Mich.
Barth Stamping & Machine Works, 3814 W. 34th St., Cleveland, O.
Breese Bros. Co., The, 2347 Reading Rd., Cincinnati, O.
Central Iron & Steel Co., Harrisburg, Pa.
Crosby Co., The, 183 Pratt St., Buffalo, N. Y.
G G G Metal Stamping Co., Dept. D, Warren, Pa.
Hubbard, M. D., Spring Co., Pontiac, Mich.
Joliet Wrought Washer Co., Joliet, Ill.
Lansing Stamping Co., Lansing, Mich.
Motor Wheel Corp., Lansing, Mich.
Transue & Williams Steel Forging Corp., Alliance, O.
Wall, P., Mfg. Supply Co., Pittsburgh, Pa.

STAMPINGS (Aluminum, Bronze, Copper, Brass, Steel)
Akron-Selle Co., Akron, O.

STAMPS, STEEL AND MARKING DIES
Schwerdtle Stamp Co., 39 Cannon St., Bridgeport, Conn.

STARTERS (Electric Motor)
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland, O.

STAYBOLTS
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.

STEAMSHIP COMPANIES
Cleveland & Buffalo Transit Co., The, E. 9th St. Pier, Cleveland, O.

STEEL
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Central Alloy Steel Corp., Massillon, O.
Gulf States Steel Co., Birmingham, Ala.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
Interstate Iron & Steel Co., 104 S. Michigan Ave., Chicago, Ill.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Kidd Drawn Steel Co., Aliquippa, Pa.
Pacific Coast Steel Co., Rialto Bldg., San Francisco, Calif.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Superior Steel Corp., Union Trust Bldg., Pittsburgh, Pa.
West Leechburg Steel Co., Farmers Bank Bldg., Pittsburgh, Pa.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

STEEL (Alloy)
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Firth-Sterling Steel Co., McKeesport, Pa.
Interstate Iron & Steel Co., 104 S. Michigan Ave., Chicago, Ill.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Timken Roller Bearing Co., The, Canton, O.
Vanadium Corp. of America, 120 Broadway, New York City.
Wheelock, Lovejoy & Co., 128 Sidney St., Cambridge, Mass.

STEEL (Alloy, Cold Drawn)
Timken Roller Bearing Co., The, Canton, O.
Union Drawn Steel Co., Beaver Falls, Pa.

STEEL (Carbon)
Andrews Steel Co., Newport, Ky.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.

STEEL (Case Hardened)
Jones & Laughlin Steel Corp., Pittsburgh, Pa.

STEEL (Cold Drawn)
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Bethlehem Steel Co., Bethlehem, Pa.
Bliss & Laughlin, Inc., Harvey, Ill.
Globe Wire Co., Sharpsburg, Pa.
Kidd Drawn Steel Co., Aliquippa, Pa.
Pittsburgh Tool Steel Wire Co., Monaca, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Superior Steel Products Co., Monaca, Pa.
Union Drawn Steel Co., Beaver Falls, Pa.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

STEEL (Crucible)
Firth-Sterling Steel Co., McKeesport, Pa.

STEEL (Die)
Andrews Steel Co., Newport, Ky.

STEEL (High Speed)
Allen, Edgar, Steel Co., Inc., 718-722 W. Lake St., Chicago, Ill.
Braeburn Alloy Steel Corp., Braeburn, Pa.
Firth-Sterling Steel Co., McKeesport, Pa.

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Vanadium Alloys Steel Co., Latrobe, Pa.
Wheelock, Lovejoy & Co., Inc., 128 Sidney St., Cambridge, Mass.

STEEL (Open Hearth)
Andrews Steel Co., Newport, Ky.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Central Alloy Steel Corp., Massillon, O.
Gulf States Steel Co., Brown-Marx Bldg., Birmingham, Ala.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Timken Roller Bearing Co., The, Canton, O.
Washburn Wire Co., Phillipsdale, R. I.

STEEL (Open-Hearth—Cold Drawn)
Union Drawn Steel Co., Beaver Falls, Pa.

STEEL (Rustless)
Firth-Sterling Steel Co., McKeesport, Pa.

STEEL (Screw Stock)
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Superior Steel Products Co., Monaca, Pa.

STEEL (Special Analysis)
Andrews Steel Co., Newport, Ky.

STEEL (Spring)
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Bethlehem Steel Co., Bethlehem, Pa.
Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Vanadium Corp. of America, 120 Broadway, New York City.

STEEL (Stainless)
Allegheny Steel Co., Brackenridge, Pa.
Firth-Sterling Steel Co., McKeesport, Pa.

STEEL (Stamping and Drawing)
Columbia Steel Co., Standard Life Bldg., Pittsburgh, Pa.
Griffin Mfg. Co., 15th and Cherry Sts., Erie, Pa.
Superior Steel Corp., Union Trust Bldg., Pittsburgh, Pa.

STEEL (Staybolt)
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.

STEEL (Strip, Hot and Cold Rolled)
Acme Steel Co., 2849 Archer Ave., Chicago, Ill.
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Central Alloy Steel Corp., Massillon, O.
Columbia Steel Co., Standard Life Bldg., Pittsburgh, Pa.
Elliott-Blair Steel Co., New Castle, Pa.
Griffin Mfg. Co., 15th and Cherry Sts., Erie, Pa.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Pittsburgh Cold Rolled Steel Co., Verona, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Superior Steel Corp., Union Trust Bldg., Pittsburgh, Pa.
Trumbull Steel Co., The, Warren, O.
Weirton Steel Co., Weirton, W. Va.
West Leechburg Steel Co., Farmers Bank Bldg., Pittsburgh, Pa.

STEEL (Structural)
Alliance Structural Co., The, Alliance, O.
American Bridge Co., 71 Broadway, New York City.
Belmont Iron Works, 22nd and Washington Ave., Philadelphia, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.
Bollinger-Andrews Construction Co., 1016 Empire Bldg., Pittsburgh, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Eichleay, John, Jr., Co., So. 20th and Wharton, Pittsburgh, Pa.
Fleming Mfg. Co., New Castle, Pa.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
Kratzer, W. N., Co., 3212 Smallman St., Pittsburgh, Pa.
McClintic-Marshall Co., Oliver Bldg., Pittsburgh, Pa.
Ohio Structural Steel Co., The, Newton Falls, O.
Pacific Coast Steel Co., Rialto Bldg., San Francisco, Calif.
Phoenix Iron Co., The, 20 So. 15th St., Philadelphia, Pa.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birmingham, Ala.
Wallace Equipment Co., 11th St. S. W. and Hanford, Seattle, Wash.

STEEL (Tool)
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Braeburn Alloy Steel Corp., Braeburn, Pa.
Firth-Sterling Steel Co., McKeesport, Pa.
Kidd Drawn Steel Co., Aliquippa, Pa.
Latrobe Electric Steel Co., Latrobe, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Vanadium Alloys Steel Co., Latrobe, Pa.
Wheelock, Lovejoy & Co., Inc., 128 Sidney St., Cambridge, Mass.

STEEL (Swedish)
Brown-Wales Co., 493 C St., Boston, Mass.
Stahleker Steel Corp., 19 Congress St., Boston, Mass.

STEEL BUILDINGS—See BRIDGES, BUILDINGS AND VIADUCTS

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Bethlehem Steel Co., Bethlehem, Pa.

STEEL DOORS AND SHUTTERS
Kinnear Mfg. Co., 818-868 Field Ave., Columbus, O.

STEEL FABRICATORS—See BRIDGES, BUILDINGS AND VIADUCTS

STEEL PLATE CONSTRUCTION
Biggs Boiler Co., The, Akron, O.
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.
Blystone Mfg. Co., Ironton St., Cambridge Springs, Pa.
Hammond Iron Works, Warren, Pa.
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.
Petroleum Iron Works Co., Sharon, Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Sotter Bros., Inc., Pottstown, Pa.
Steel Plate Products Co., Pottstown, Pa.

STEEL PLATES — See PLATES (Iron and Steel)

STEEL STAMPINGS—See STAMPINGS

STELLITE
Haynes Stellite Co., 30 E. 42nd St., New York City.

STEP HANGERS
Transue & Williams Steel Forging Corp., Alliance, O.

STEPS (Ladder and Stair, Nonslipping)
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.
Irving Iron Works, Long Island City, N. Y.

STOKERS
Babcock & Wilcox Co., The, 85 Liberty St., New York City.
Combustion Engineering Corp., 200 Madison Ave., New York City.
Jones, W. A., Foundry & Machine Co., 4437 W. Roosevelt Rd., Chicago, Ill.

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Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.

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Treadwell Engineering Co., Easton, Pa.

Strip Steel (Cold Rolled)
Morris & Bailey Division, Oliver Iron & Steel Cor., Oliver Bldg., Pittsburgh, Pa.

STRIPSHEETS
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.

STRIP STEEL STRAIGHTENERS
Shuster, The F. B., Co., New Haven, Conn.

STRIP STEEL (Cold Rolled)
Morris & Bailey Division, Oliver Iron & Steel Corp., Oliver Bldg., Pittsburgh, Pa.

STRUCTURAL IRON AND STEEL WORK — See STEEL (Structural)

SUB-PRESSES — See PRESSES (Sub)

SULPHURIC ACID
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.

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Bethlehem Steel Co., Bethlehem, Pa.

SWITCHBOARDS
Taylor Instrument Co., 95 Ames St., Rochester, N. Y.

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Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland, O.

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Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.

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National Tube Co., Frick Bldg., Pittsburgh, Pa.

TANKS (Storage, Pressure, Riveted, Welded)
Air Tight Steel Tank Co., Mansion and Gloster Sts., Pittsburgh, Pa.
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Hammond Iron Works, Warren, Pa.
Petroleum Iron Works Co., Sharon, Pa.
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Dietzel Lead Burning Co., Keystone Bldg., Pittsburgh, Pa.

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National Acme Co., E. 131st St. & Coit Rd., Cleveland, O.
Rickert-Shafer Co., Dept. T. M., Erie, Pa.

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American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Weirton Steel Co., Weirton, W. Va.

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Riehle Bros. Testing Machine Co., 1424 N. 9th St., Philadelphia, Pa.

TESTING MACHINES (Pipe)
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

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Landis Machine Co., Waynesboro, Pa.

THREADING MACHINERY
Rickert-Shafer Co., Dept. T. M., Erie, Pa.

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Illinois Steel Co., So. 208 LaSalle St., Chicago, Ill.

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Century Wood Preserving Co., 1058 Century Bldg., Pittsburgh, Pa.

TILE (Cement Roofing)
American Cement Tile Mfg. Co., Oliver Bldg., Pittsburgh, Pa.

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American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Granite City Steel Works, The, Granite City, Ill.
Mansfield Sheet & Tin Plate Co., Mansfield, O.
National Enameling & Stamping Co., Granite City, Ill.
Trumbull Steel Co., The, Warren, O.
Weirton Steel Co., Weirton, W. Va.

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Irving Iron Works, Long Island City, N. Y.

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Treadwell Engineering Co., Easton, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

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Tyler Tube & Pipe Co., The, Washington, Pa.

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Bethlehem Steel Co., Bethlehem, Pa.
Keating, E. F., Co., 446-54 Water St., New York City.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tyler Tube & Pipe Co., The, Washington, Pa.
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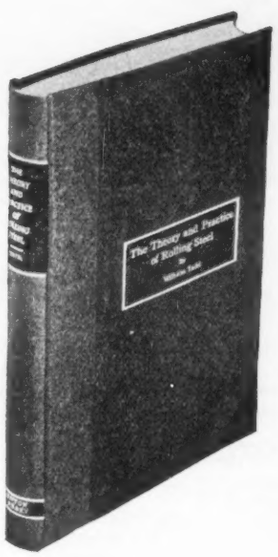

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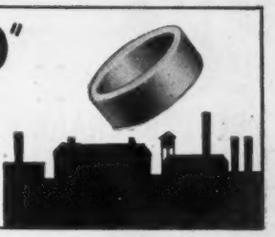

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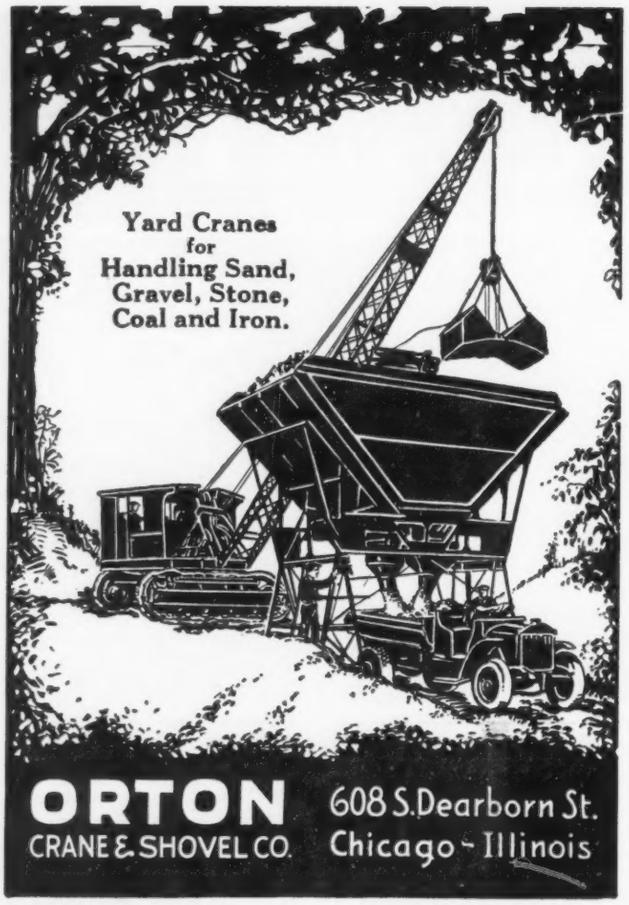

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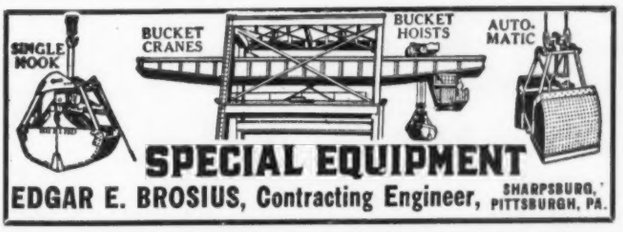

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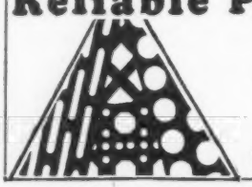

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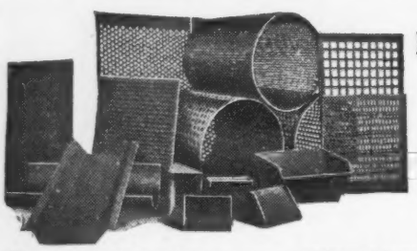

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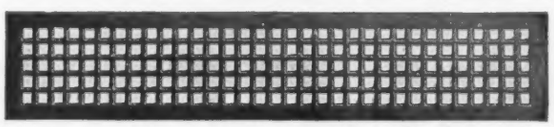

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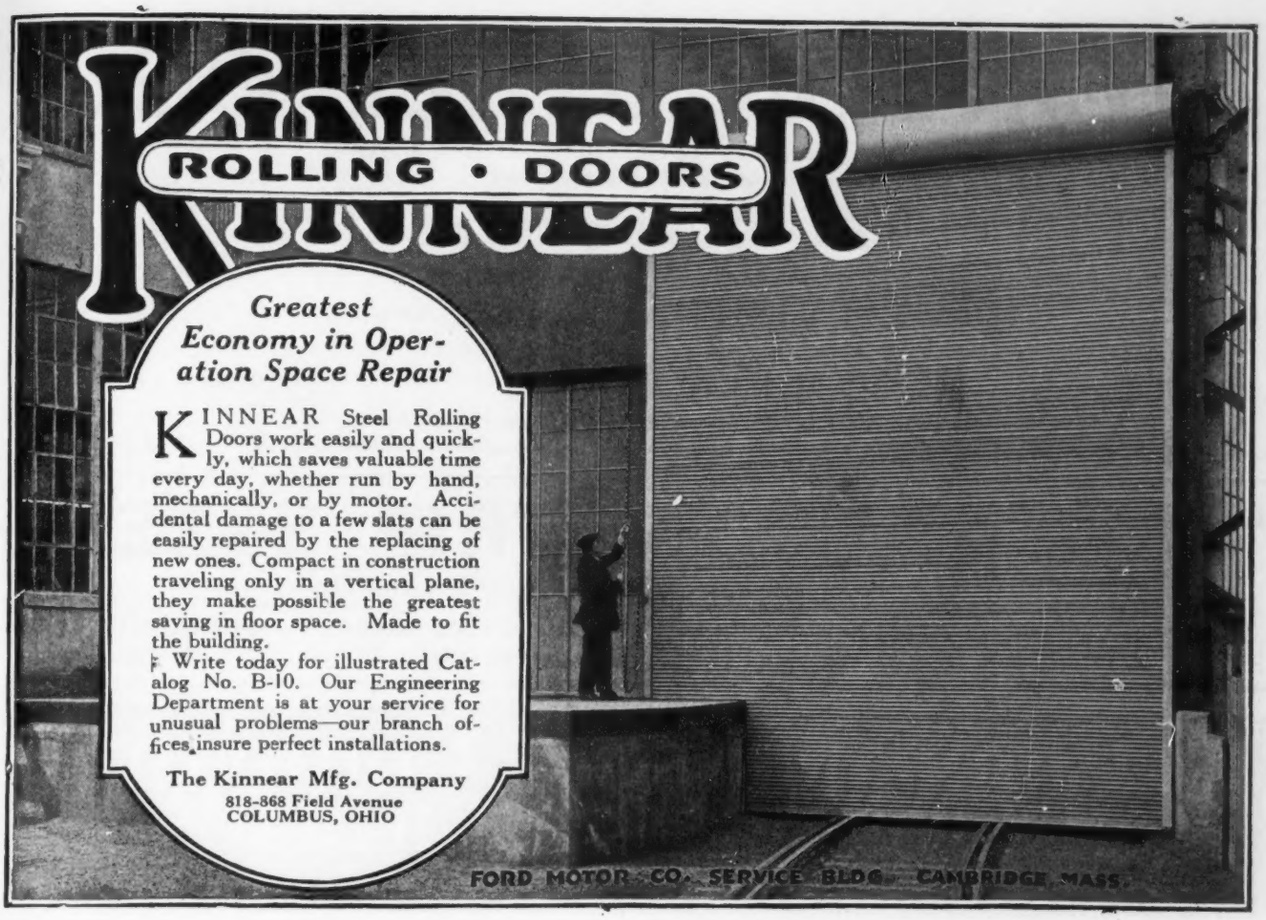

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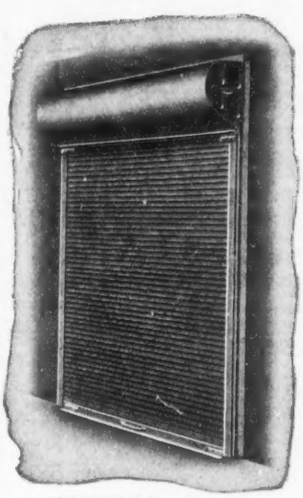

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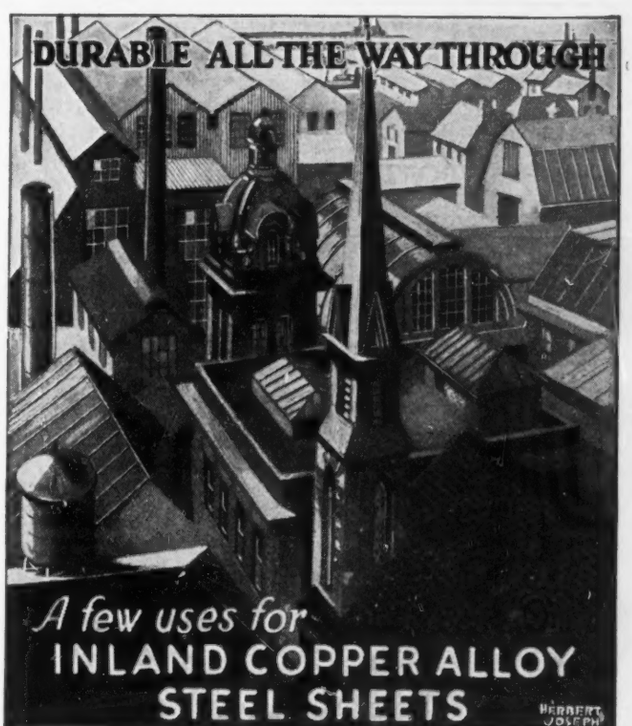

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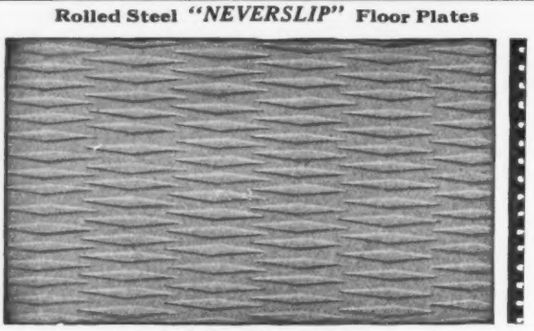

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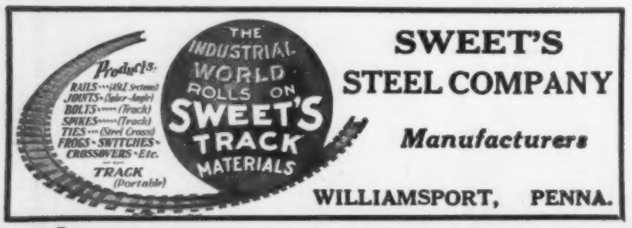

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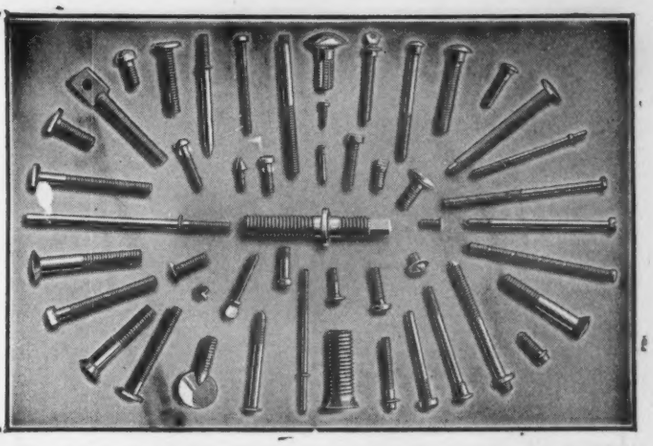

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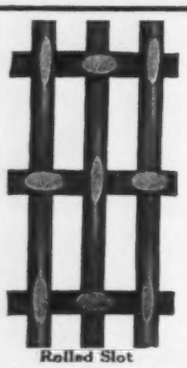

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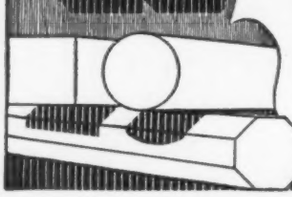

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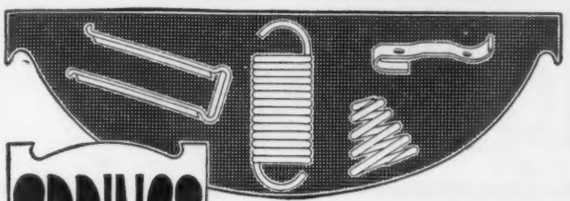

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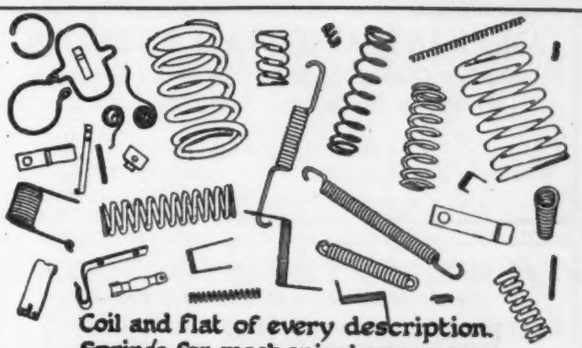

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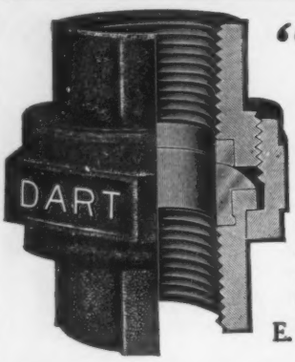

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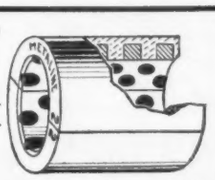

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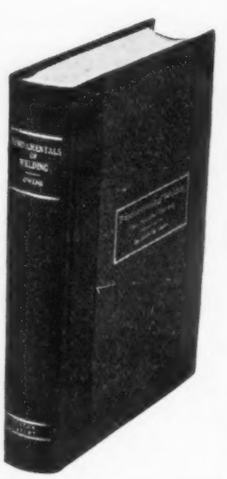

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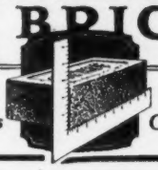

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INDIANA

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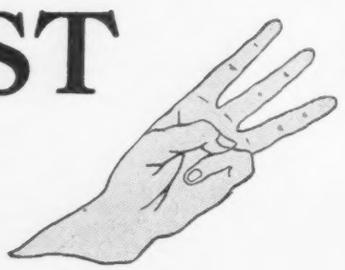

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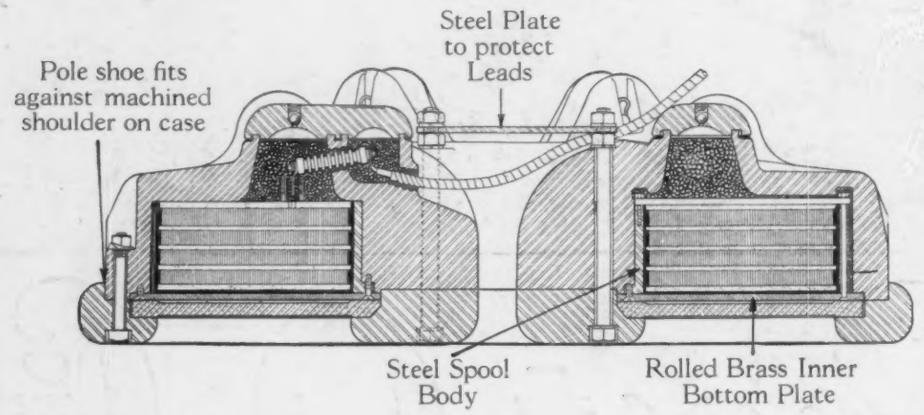
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